STEEL

PRODUCTION

PROCESSING

DISTRIBUTION

USE

EDITORIAL STAFF

E. L. SHANER
EDITOR

ASSOCIATE EDITORS

E. C. BARRINGER
A. J. HAIN
G. H. MANLOVE
E. A. FRANCE JR.
E. F. ROSS
J. D. KNOX
A. H. ALLEN
GUY HUBBARD

New York
E. C. KREUTZBERG
B. K. PRICE
L. E. BROWNE

Pittsburgh
W. G. GUDE

Chicago
F. B. PLETCHER

Washington
L. M. LAMM

London
VINCENT DELPORT

BUSINESS STAFF

GEORGE O. HAYS
BUSINESS MANAGER

New York
E. C. KREUTZBERG
E. W. KREUTZBERG

Pittsburgh
S. H. JASPER

Chicago
L. C. PELOTT

Cleveland
JOHN HENRY
R. C. JAENKE

CONTENTS

May 30, 1932

THE WEEK IN STEEL	9
Steel Trend Line Vigorously Upward as Deficiency Mounts	11
Business News from Washington	12
Hold Clinic on Steel House, Market for 3,500,000 Tons	13
Industrial Men in the Day's News	14
Here and There in Industry	15
Mirrors of Motordom	16
Japan's Scrap Takings Lift April Exports; Imports Fall	17
Obituary	17
EDITORIAL—Revamping America Means Work for Industry	18
THE BUSINESS TREND	19
Four-Ton Coreless Induction Furnace Installed	23
Panels Made of Plied Steel and Wood Find New Uses	25
Hydrogen in Rimming Steel Has Adverse Effect	27
Exchange Ideas on Economy in Open-Hearth Practice	29
Making the Most of Steel	30
Large Uses of Steel in Small Ways—Bobby Pins	31
Cadmium Is Plated by New Process	31
Progress in Steelmaking	32
Scanning the Technology of Steel	34
New Equipment	36
MARKET REPORTS AND PRICES	41-60
CONSTRUCTION AND ENTERPRISE	60
WHERE-TO-BUY DEPARTMENT	61
ADVERTISERS' INDEX	75

STEEL is published every Monday by PENTON PUBLISHING CO., Penton Building, Cleveland, O. C. J. STARK, President; J. D. PEASE, Vice President; F. V. COLE, Secretary. Member, Audit Bureau of Circulations; Associated Business Papers Inc., and National Publishers Association. Branch Offices: New York, 220 Broadway; Chicago, Peoples Gas building; Pittsburgh, Oliver building; San Francisco, Alto building; Washington, National Press building; Cincinnati, Schmidt building; London, Caxton House, Westminster, S. W. 1; Berlin, Lichterfeld-West, Dahlmerstrasse 64a, Germany. Subscription in the United States, Cuba and Mexico $6 per year; in Canada $8.60; in Great Britain and European countries £2:8s.

Entered as second class matter at post office at Cleveland under the Act of March 3, 1879.

Copyright 1932 by the Penton Publishing Co.

Now is the Time To Buy Immediate Steel

Immediate steel makes it possible to take advantage of every sudden change in volume—to gear purchases to fidgety production schedules—and it frees profit from the drag of slow material deliveries.

Immediate steel—ready to use—is quickly available from ten strategically located Ryerson plants. It includes the full range of sizes and kinds of steel products making it easy to concentrate purchases and save time, trouble and money. Unparalleled facilities for cutting, handling and shipping, developments of almost a century of steel-service, assures accuracy and dependability. No order is too large for immediate shipment nor too small for personal attention.

Buy immediate steel from the nearest Ryerson plant and production will not be held up on account of slow deliveries.

Bars	Sheets, Full Finished	Strip Steel	Forging Bars	Allegheny Metal
Structurals	Refined Iron	Boiler Tubes and Fittings	Babbitt Metal	Concrete Reinforcing
Rails	Turned Ground and Polished Shafting	Rivets and Bolts	Billets	Firmtread Plates
Plates	Screw Stock	Welding Rod	Tool Steel	Small Tools
Sheets, Blk. & Galv.			Alloy Steel	Machinery, etc.

JOSEPH T. RYERSON & SON, INC.: Chicago, Milwaukee, St. Louis, Cincinnati, Detroit, Cleveland, Buffalo, Boston, Philadelphia, Jersey City

RYERSON

STEEL-SERVICE

Volume 90 Number 22

STEEL

For forty-eight Years—IRON TRADE REVIEW

PRODUCTION ◆ PROCESSING ◆ DISTRIBUTION ◆ USE

The Week In Steel

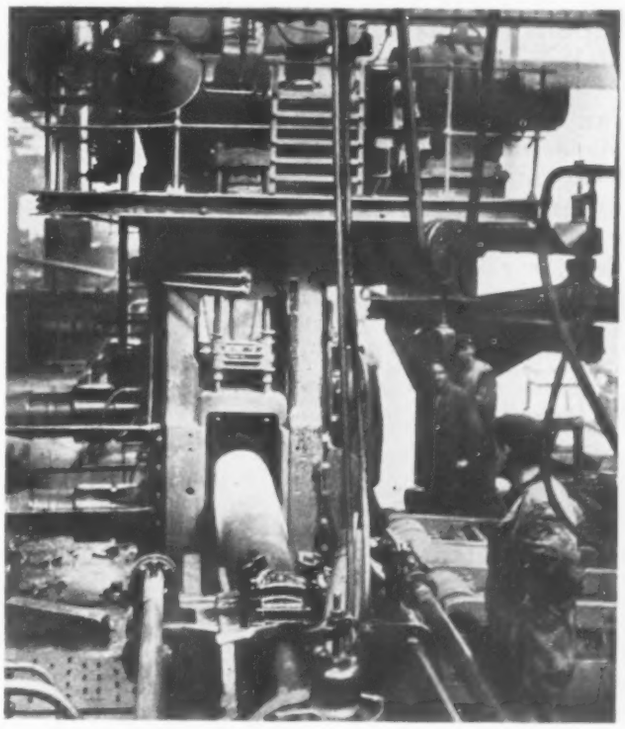
WHEN Colonel Ayres in 1921 explored the production of steel ingots and castings for the preceding 25 years and projected a trend line into the future his computation of normal for 1929 proved to be within 5 per cent of the fact. Again Colonel Ayres gazes into the crystal of his mathematical formulae and extends this so-called regression line, disclosing potentialities for steel as attractive as the current defiiciency is alarming (p. 11). After all, it appears that 1929 was not an abnormal year; its production was only 2,900,000 tons in excess of the long-range forecast and in effect balanced the shortage of 1927. But since 1929 a deficiency of 59,000,000 tons has accumulated, which would require 13 feverish months at the 1929 average of 89 per cent of capacity to work off, to say nothing of any new demands. To put it another way, in the past 2½ years each person in the United States has consumed 1056 pounds of steel less than normal, without taking into consideration any new wants.

Hold Raising Bee for Steel House

Among new demands for steel now crowding this deficiency in production is the small residence. If only steel-frame houses be considered, the potential market here for steel is 3,500,000 tons annually; any progress toward all-steel construction would measurably enlarge this estimate. At the small house forum (p. 13) sponsored by the American Institute of Steel Construction every possible angle of thought was focused on the steel house problem. Producers of steel visualize the fabrication of standard sections, stocked by warehouses and readily available to contractors; welders believe their process inextricably linked with both shop and field erection; the incentive to all factors to lower their costs is the certainty that the market for the steel house will expand in mathematical ratio; because women's wishes in house planning are paramount, sales policies of the steel industry may have to be tempered accordingly.

Scrap Is Curving Pig Iron Trend Line

In pig iron the same lag behind normal as in steel is observable (p. 11), but as the use of scrap in the manufacture of steel expands, a curve rather than a straight line will more aptly depict the long-time trend in production .... Japan also is learning the merit of increasing the proportion of scrap, her purchase of 19,047 tons in April putting United States' exports of iron and steel in that month to the highest level since November (p. 17). Less pig iron is coming in to trouble the eastern seaboard, but receipts of 4151 tons of tin plate in April were



Acme Photo

This steel pipe, part of 60,000 tons being rolled in the Glasgow works of Stewarts & Lloyds Ltd., will carry oil through the Holy Land from Iraq to the Mediterranean

Wide World Photo

Column-nuts—two equaling a man in height—manufactured for two huge forging presses by the Hydraulic Co., Duisburg, Germany

160 times those in February, almost double those of March. Tin plate labor in the United States has been greatly exercised over the price-cutting tactics of foreign manufacturers.

Imports Hurdle Tariff Barriers

These imports of tin plate, harassing American manufacturers, originated largely in South Wales, which in turn is a sore spot for British blast furnaces because the Welsh are buying so much pig iron on the Continent (p. 55). Indian iron, against which there is no guard in the new British tariff, is plaguing Scottish blast furnaces. . . . Capital is being sought in the Pittsburgh district for the construction (p. 12) of a tin plate mill at Vandergrift, Pa. . . . Importers of concrete reinforcing bars have won a 90-day stay on the treasury department order requiring the origin of foreign bars to be indicated (p. 12) but after July 15 the victory of domestic bar interests will be complete.

Induction Furnaces Reach 4-Ton Stage

Quantity, not quality, has long been the handicap of the coreless induction furnace. Two 4-ton furnaces of this type—one installed and a second under construction—in a Chicago district steelworks are the largest yet attempted (p. 23). Design of electrical equipment to generate and carry 12,000-ampere 1000-cycle current was a major problem. . . . In this furnace stainless steel scrap is being melted without changing its chemical composition (p. 32), 76 heats of 4 tons each valued at $112,000, being made on one lining. . . . Makers of 18-8 utensils report (p. 30) it advisable to heat-treat promptly after each draw.

Hydrogen Guilty, but Eludes Capture

Skinholes, the bane of rimming steel and the cause of serious if not ruinous defects in ingots, are traceable to hydrogen, and the objective of every steelmaker is to destroy or at least minimize its influence (p. 27). A vast amount of research on gases in steel seems to be required. . . . Open-hearth operators are successful in keeping costs somewhat in line with curtailed schedules, but closer supervision of the open-hearth floor is desirable (p. 29). . . . Commercially pure magnesium oxide is the ideal open-hearth bottom material (p. 32), one steelmaker contends, and the older the bottom the lower the fusion point. . . . Many European blast furnaces (p. 32) now are using acid bottoms.

Cadmium, Rubber or Paint Protect

A new process for electroplating iron and steel parts with cadmium is announced (p. 31), a dense-grained nonporous deposit providing maximum resistance to corrosion and a clear silver-white finish being held out as major advantages. . . . A totally different application of coating is the use of an air spray gun (p. 30) for lining metal containers with rubber latex. . . . A protective paint for blast furnace shells, boiler fronts and other surfaces exposed to extreme heat and changes of atmospheric conditions is offered (p. 32) by a manufacturer. . . . Marine work, truck and bus bodies, hospital and kitchen equipment are some outlets for a new material (p. 25) which is a stiff plywood panel to which a metal face is cemented.

Steel Rate Slides; Sentiment Holds

Not even a decline of 2½ points in the steelmaking rate to 23 per cent (p. 41) dampens a robust, underlying conviction that the pull in the markets is toward improvement. . . . Ford, beginning to hit his stride and aiming at 90,000 units or more in June (p. 16), is distributing parts orders in the best volume in over a year. . . . Structural steel awards last week, including 23,500 tons for federal projects (p. 46), set a new high for 1932. . . . Manganese ore will not be subject to a double duty (p. 12), the senate killing the Oddie proposal for a 1-cent excise tax.

Steel Trend Line Vigorously Upward as Deficiency Mounts

IF THE steel industry should suddenly speed up to the rate at which it operated in 1929—the peak in its history—it would take more than 12 months merely to produce an amount of steel ingots and castings equal to unfilled normal needs for 1930, 1931, and 1932 to date.

Output in 1930 fell 13,483,713 gross tons below calculated normal for that year. In 1931 the shortage was 29,263,805 tons; and for the five months this year 16,278,522 tons, a total of 59,026,040 tons. Operating at 89 per cent in 1929, the industry produced 56,433,473 tons.

"Normal" Line Calculated

The figure—59,026,040 tons—represents the difference between actual output since 1929 and the tonnage which would been produced had normal requirements asserted themselves. "Normal" has been calculated by Col. Leonard P. Ayres, vice president, Cleveland Trust Co., nationally known statistician, and the normal trend line will be noted on the accompanying chart. The line is the so-called regression line, or line of least squares, employed to express the long-range trend of an irregular series. It is computed mathematically, as the straight line from which the irregular lines deviate less than from any other straight line.

In August, 1921, Colonel Ayres computed a similar trend (see *Iron Trade Review*, STEEL'S predecessor, Aug. 4, 1921). The normal line which he then drew for steel ingots and castings, carried forward, indicated 55,900,000 tons normal for 1929. As it developed, production in 1929 was 56,433,473 tons, generally conceded to be above normal.

Actual output in the intervening eight years revealed a surprising degree of comformity with the projected line. This gives credence to Colonel Ayres' new trend line for steel ingots and castings, recalculated to embrace the industry's experience from 1921 to 1929.

The forecast for steel—if the trend line could be called such—made in the depression of 1921, held true, in that actuual production approximated normal, up to the time of the great world economic upheaval, and even now there is nothing to upset the general conclusion respecting requirements.

The steadiness and upward swing in steel has not been paralleled in pig iron, as since the World war new influences, mainly within the industry, have been tending to retard ouput. For one thing there is the increasing use of scrap in place of pig iron for the manufacture of steel. The normal trend for pig iron calculated in 1921 indicated 45,000,000 tons in 1929 whereas actual was 42,270,183 tons.

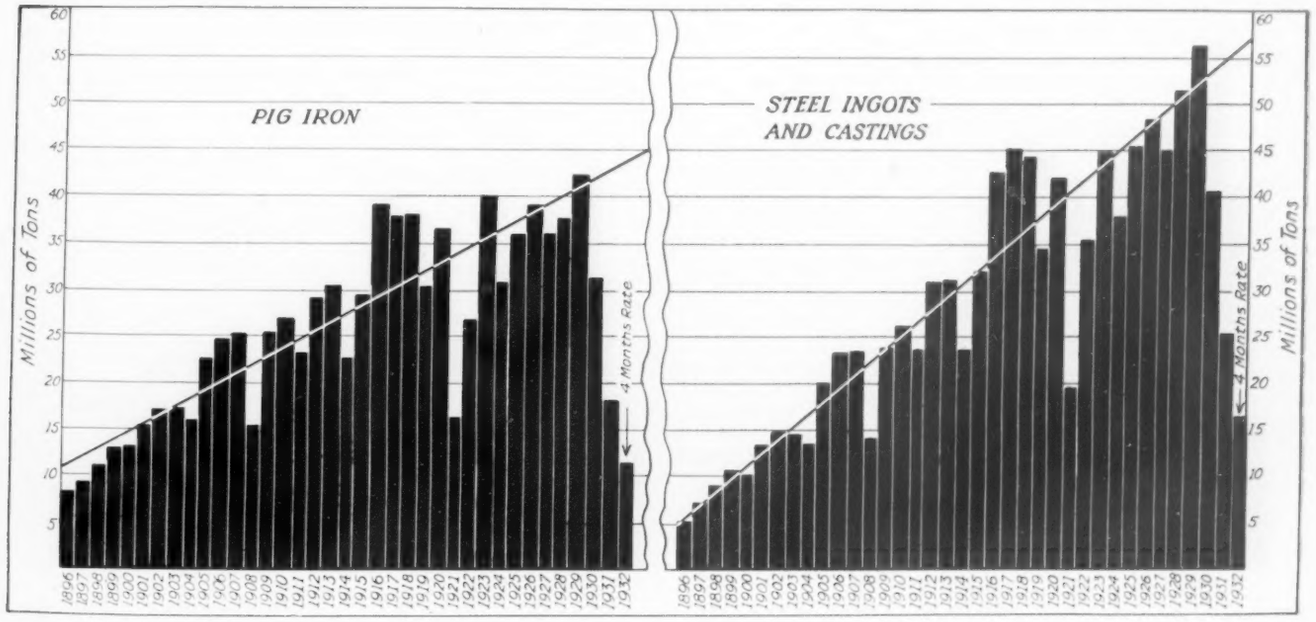
This line also has been recalculated, taking into consideration experiences since 1921. The same degree of reliance cannot be placed upon it as on that for steel ingots and castings, and it is probable that in the future a curved line, rather than straight, more properly will be used in mathematical calculations to express normal trend for pig iron.

Nevertheless, on the new calculation in consonance with actual production over the past 37 years, it is interesting to note that the discrepancy between output in 1930 and the theoretical normal for the year was 10,333,512 gross tons; for 1931, 24,383,989 tons, and for the five months this year, 13,523,264 tons—the aggregate being 48,240,765 tons. The industry produced 42,270,183 tons of pig iron in 1929; therefore, it would take nearly 14 months for blast furnaces operating as they did in 1929 to make up the deficiency.

Far Behind in Production

The possibility of a slight variance here in calculated "normal" does not disturb the fact that the industry is behind in the production necessary to satisfy ordinary needs, and that upon the turn of the tide there must ensue an immense amount of extra effort to catch up with demand.

Reference to the chart will show that the "deficiency" in iron and steel production in the past 28 months is



GRAPHIC PORTRAYAL OF PENT-UP DEMAND FOR IRON AND STEEL: Production of pig iron, and steel ingots and castings, in gross tons, with lines showing normal trends. Steel output in the aggregate is 59,026,040 tons below normal for the period 1930, 1931 and 1932 to date; pig iron, 48,240,765 tons below normal. The deficiency in both instances, amounting to more than actual output in the banner year 1929, is far greater than that for all prior periods since 1896, combined. A large share of this shortage eventually will have to be made up, in addition to production for new, oncoming requirements. Perpendicular columns for 1932 indicate total production for the year, computed on the basis of actual output for the first four months of the year for both pig iron and steel ingots and castings

considerably greater than that for all the prior subnormal periods since 1896, combined.

Overproduction in 1929 was early and generally assigned as one of the main reasons for the reaction in 1930 and 1931 because deeper causes were not perceived. Industry did not slow up merely to permit consumption to catch up, for if it had, the wheels would not have remained idle for so long; there would not have been a drastic shrinkage in production for three consecutive years.

Per Capita Use Is Behind

Per capita production of steel ingots and castings in 1929 was 1040 pounds, whereas if it had conformed to normal it would have been only 93 pounds less, in all 947 pounds. Viewed from the per capita standpoint, every person in the United States now is potentially a better prospect for steel products than in 1929.

This is indicated by the fact that in 1930 the per capita output was 229 pounds below normal; for 1931 it was 537 pounds below normal, and for the five months this year, 290 tons. This takes due account of the average increase in population. It means that the theoretical, accumulated unsatisfied requirements in this period amount to 1056 pounds per capita, a large portion of which must eventually be supplied, at the same time as new demands arise, if the normal trend in steel carries on.

Seek Funds for Tin Plate Mill at Vandergrift

Proposal has been made to construct a $1,000,000 tin plate plant at Vandergrift, Pa., according to the plan of citizens of Leechburg, Pa. Funds for the project will be partially obtained from outside sources, leaving about $350,000 to be raised by citizens of towns in the Pittsburgh region. Noble Jones, superintendent, West Leechburg Steel Co., has been prominent in the plan. The Vandergrift chamber of commerce has been asked to arrange for the sale of stock.

Delays Bar Marking Order On Imports 90 Days

Washington—The treasury department has announced that the new marking order for concrete reinforcing bars to be applied to all imported bars will become effective 90 days after April 14. This is the only thing that the importers gained by their recent hearing in the case, a slight delay in the time of putting the order into effect. Domestic bar sellers complained some time ago.

The Business Week In Washington

PRESIDENT Hoover and Secretary Mills continue adamant against a program of public works to relieve unemployment but before congress adjourns it appears almost certain that some sort of relief measure will pass, involving the financing of construction and the use of considerable steel.

The President is not opposed to projects which are self-amortizing, like toll bridges and tunnels. In both houses there appears to be a majority in favor of a federal gesture toward financing public or semipublic construction, estimates of a probable expenditure ranging from $300,000,000 to $2,400,000,000.

Practically all of the projects named, in an indefinite way, require structural steel. The tonnage necessarily is vague but might approximate several hundred thousands.

□ □ □

Proposal of Senator Tasker L. Oddie to put an excise tax of 1 cent a pound on manganese ore, equal to the present tariff duty, was defeated on the floor of the senate, May 27, in consideration of the revenue bill.

□ □ □

Panama canal tolls are the lowest since 1923.

Light Waves Iron's Strength?

A PECULIAR kind of light wave within iron, such waves being forms of radiation by which atoms exchange energy and by which they were closely tied together, may be the source of strength of iron, Dr. Francis Bitter, of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., related recently to the American Physical society, meeting in Washington.

Germans Get Contract To Build Chinese Steelworks

A contract has been signed between the ministry of industry of China and the German firm of Gutehoffuenshuttle, Oberhausen, in connection with the establishment of an iron foundry and steelworks. The plant will be designed to give an output of 500 tons of pig iron and 500 tons of steel daily, and the cost of building and equipment is expected to amount to about $20,000,000 gold.

The government proposes to issue bonds for this amount, the security for which will be approved by the German contractors, and the plant is expected to be in operation in about three years. A party of Chinese and German experts has started for Anhui to select a suitable site for the steelworks in one or other of the various coal-producing districts of that province.

Colorado To Use Own Ore

Colorado Fuel & Iron Co., Denver and Pueblo, Colo., hereafter will use iron ore only from its mines at Sunrise, Wyo. Since 1916 the company has been using some ore supplied by the Hanover-Bessemer mine at Silver City, N. Mex., this being supplied on a contract calling for a minimum of 14,000 tons monthly. Last year the Sunrise mine supplied 187,000 tons of ore; under the present schedule it will provide approximately 300,000 tons.

Now Fittings Go on Quota

Washington— Import quotas have been established for importation into France of pipe fittings and certain builders' hardware until June 30 according to a cablegram to department of commerce.

For pipe fittings (flanges, and joints of iron, cast iron or steel, welded or not), a quota of 198.2 metric tons is fixed for imports from the United States and all other countries combined, except Germany and Switzerland.

More Power for Industry

Washington—Bureau of the census has issued a special report presenting detailed statistics of prime movers and electric motors in use or available for use in manufacturing and printing establishments at the close of 1929, by states and for industrial areas. For the United States as a whole, the aggregate horsepower of such prime movers and electric motors driven by purchased energy in 1929 was 42,931,061, compared with 38,825,681 in 1927 and 29,323,653 in 1919.

Buffalo Stacks Still Cold

Buffalo—Rumors have persisted here that both the Wickwire and Tonawanda blast furnaces would resume operations about June 1, but inquiry reveals that both rumors are unfounded.

Crosby Co. Adjusts Stock

Buffalo—The Crosby Co., sheet metal stamping, has reduced its capital stock from $2,700,000 to $1,400,000 to make allowance for stock which has been retired over the past

few years. A reduction in the value of the common stock probably will be made. Neither development, according to the company, has any significance other than a bookkeeping adjustment.

Simonds Operating Full

Simonds Saw & Steel Co. plant at Lockport, N. Y., has gone on a 100 per cent operating schedule, which it expects to maintain for three to four weeks.

Financial News of Steel Industry

CRUCIBLE STEEL CO. of America has omitted the $1.75 quarterly preferred dividend owing to the fact that the company is not operating more than 25 per cent and uncertainty created by failure of congress to frame an equitable tax bill and balance the national budget.

□ □ □

McKeesport Tin Plate Co., McKeesport, Pa., has declared the regular quarterly dividend of $1, payable July 1 to record June 10.

Cleanliness May Win Award

Any manufacturer with a definite plan for raising the standards of employe and plant cleanliness for the sake of efficiency, health and better attendance records is invited to outline it to the Cleanliness institute, 45 East Seventeenth street, New York, with the possibility of receiving a cash award of $25.

Steel Club Has Outing

The Philadelphia Structural Steel Board of Trade, Philadelphia, held its annual outing at the Sandy Run Country club, May 24.

Hold Clinic on Steel House, Market for 3,500,000 Tons

ULTIMATE development in steel-frame small house design and construction, with the average steel warehouse distributing fabricated light sections to the building site ready for immediate erection largely in assembled units, was visualized as the ultimate goal of at least one steel producer at meetings of a small house forum sponsored by the American Institute of Steel Construction at the Engineering Societies building, New York, May 24 and 25.

Influence of design, costs, insurance rates, welding, speed in erection, beauty and utility in the use of steel in residence building was covered, the forum including experiences of other modern materials producers with improved methods.

Potential Market 3,500,000 Tons

The small building field offers a potential market for 3,500,000 tons of steel annually, it being the consensus of opinion among pioneer sponsors of steel-framed small houses that, while progress has been made steadily, there remains much important work to be done in the way of selling the idea to the layman, the individual home-builder. Already an estimated 3000 steel-frame houses have been built in the United States.

Noncorrosive chromium-nickel steel is already a factor in steel residence building and this was discussed at a special symposium when emphasis as to its architectural uses and from a standpoint of welding were discussed.

Presiding at the four sessions were: T. J. Foster, National Bridge Works, Long Island City, N. Y., and treasurer of the American Institute of Steel Construction; Fred T. Llewellyn, consulting engineer, United States Steel Corp.; George E. J. Pistor, McClintic-Marshall Corp., and Mrs. Christine Frederick, household efficiency engineer, Greenlawn, L. I.

Several speakers were not backward in expressing the view that the housewife has an important voice in the use of steel in the home and the final say on whether or not the frame itself should be of that material.

Proper use of steel in residence construction depends to a large extent on the other materials used, according to Mr. Llewellyn, a factor too few designers and structural engineers have taken into consideration. Structural steel framing opens a new field in the designing of the small home. Mr. Llewellyn stated that if tier method of construction is followed —an unnecessary procedure—weight of the steel framing was four times and even heavier than was required, quoting stresses and loads both in the finished house and construction loads to illustrate. He elaborated on the importance of anchorage and stated that the steel in house framing must be reinforced by the enveloping material.

Sees New Market for Sheets

Continuous rolling of sheets has cause a revolution in their use in some directions, according to Bennett Chappel, vice president, American Rolling Mill Co., Middletown, O., who stated that production of sheets by the continuous mill at the rate of 32 tons an hour reflected lower costs to widen the field of consumption.

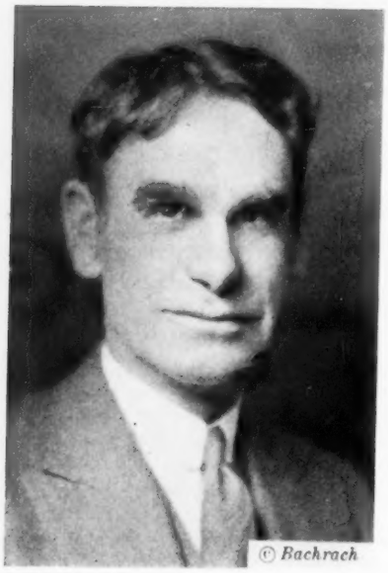
Steel in other forms offers a tremendous service in the construction field, and he ventured the opinion sheets would also be an increasing factor in small house building. Sheets are being used on small house exteriors in various enameled forms and Mr. Chappel expressed its confidence in the possibilities in this field by stating the Middletown company would have a $5000 metal house at the Century of Progress exhibition at Chicago, a unit to include a fireproof garage. Quoting figures to prove the average family income was $1350, he stressed

(Please turn to Page 55)

ABOVE is the prize winning entry in the American Institute of Steel Construction's annual bridge design contest, the problem being a highway grade separation bridge. First place was won by Boris R. Leven, University of Southern California. Second place, for design at right, was won by E. S. Okubo, same university

Industrial Men in the Day's News

Edward W. Miller, President, American Gear Manufacturers' Association


© Bachrach

LEADERSHIP of the association is a merited reward for an unflagging interest in gearing.

WITH the Fellows Gear Shaper Co. he has a record of continuous employment for 34 years.

NOTHING appeals to him like a week-end in the spruce forests of Vermont; it constitutes a hobby.

GEARS, their design and manufacture, hold a fascinating interest for Edward W. (Ted) Miller. No phase, regardless of how technical or problematical it might be, is beyond the bounds of his scope of knowledge on the subject. Pressure angles, loads and stresses in gearing are everyday routine, and his ability to cope with them has made him a leader in the profession.

That he should some day become the chief executive of the American Gear Manufacturers' association was inevitable. Mr. Miller's enthusiasm and activity in the organization presaged that. The presidency was accorded him at the recent meeting in Cleveland, and concurrent with this honor he celebrated his twelfth year as a member of the association. He also is affiliated with American Society of Mechanical Engineers and the Society of Automotive Engineers.

Mr. Miller holds another record that distinguishes him. Since his graduation from high school in Torrington, Conn., in 1898, he has been with the Fellows Gear Shaper Co., Springfield, Vt., without interruption of his service.

Torrington was the place of his birth, May 26, 1880. Following an apprenticeship for the Fellows company, he was transferred to the engineering department. After gaining experience with various technical aspects of design and production of gears and gear manufacturing equipment he was made chief engineer. That was in 1915. Since that time he has been instrumental in the development and growth of the company.

A week-end at his cabin among the spike top spruce in the Vermont mountains with a group of philosophical friends is one of his chief hobbies. Mr. Miller also is fond of athletics.

CHARLES L. WOOD, vice president and general manager of sales of the Carnegie Steel Co., Pittsburgh, has been appointed vice president in charge of sales of the United States Steel Corp., with headquarters at New York. Mr. Wood has been with the Steel corporation or its subsidiaries since 1898, when he went with the former American Steel Hoop Co. He later became assistant to the late W. G. Clyde. Mr. Wood, who is a native of Youngstown, O., is a graduate of Ohio State university. The appointment is effective June 1.

Mr. Wood succeeds E. P. Thomas who, it is stated, will be transferred to special duties. Mr. Thomas formerly was associated with the Lorain Steel Co., became president of the United States Steel Products Co., export subsidiary of the Steel corporation, and in 1928 was made a vice president of the Corporation.

Clement V. McKaig, vice president in charge of sales, Great Lakes Steel Corp., Detroit, has been named to succeed Mr. Wood as vice president and general manager of sales of the Carnegie company. Mr. McKaig is a graduate of Princeton university, Princeton, N. J., and entered the steel business at the Park works of the Crucible Steel Co., Pittsburgh. He gradually worked his way through a number of departments to the position of superintendent of bar mills. Mr. McKaig went with the Carnegie Steel Co. in 1908 and was employed there continuously in various capacities, eventually succeeding the late I. W. Jenks, general manager of the bar and hoop department in 1929. In 1930 when the Great Lakes corporation began operations Mr. McKaig severed his relations with Carnegie company to become vice president in charge of sales for Great Lakes, later merged as an operating unit of the National Steel Corp.

□ □ □

Harry C. Hedenburg, Wyman-Gordon Co., and R. B. Service Jr., the Norton Co., were elected vice presidents of the Worcester chapter, National Association of Cost Accountants, May 19. Directors include Robert S. Morrow, Reed & Prince Mfg. Co.; C. E.

Soderberg, Parker Wire Goods Co., and William J. Magee, Norton Co.

□ □ □

A. W. Clark, associated with Stone & Webster Engineering Corp., Boston, has been appointed vice president of General Refractories Co., Philadelphia.

□ □ □

Benjamin Schwartz, director general of the Institute of Scrap Iron and Steel Inc., New York, has been elected a director of the New York Trade Association Executives Inc.

□ □ □

J. Leonard Replogle, head of the former Replogle Steel Co., has retired as a special partner from the stock exchange firm of Harris, Upham & Co.

□ □ □

Clement J. Freund, for 10 years manager in charge of personnel apprenticeship and education, for the Falk Corp., Milwaukee, has resigned to accept appointment as dean of the college of engineering, University of Detroit, effective June 1.

□ □ □

Charles T. Bird, formerly identified with the American Steel Foundries, Alliance, O., and Pangborn Corp., Hagerstown, Md., has been made manager of sales, sand blast and dust arrester division, American Foundry Equipment Co., Mishawaka, Ind.

□ □ □

Merrill G. Baker has been appointed executive assistant to the president of the Blaw-Knox Co., Blaw-Knox, Pa., effective June 1. For several years Mr. Baker has been associated with Ford, Bacon & Davis Inc., New York, as assistant to the vice president.

□ □ □

F. L. Lindemuth, formerly associated with the Mesta Machine Co., Perin & Marshall and the Colorado Fuel & Iron Co., has been appointed chief engineer of the William B. Pollock Co., Youngstown, O., engineer, fabricator and erector of steel construction.

□ □ □

Hibbard S. Greene, formerly general sales manager of the Chain Belt Co., Milwaukee, has become associated with the Northwestern Mutual Life Insurance Co. of Milwaukee as a member of the home office agency. Prior to joining the Chain Belt organization, Mr. Greene was vice president of the Barber-Greene Co., Aurora, Ill. He is a director of the Interstate Drop Forge Co., Milwaukee.

□ □ □

F. E. Herzog, Buffalo steelworks engineer, has been awarded the rank of "Udarnik," high compliment given by the soviet government only to persons performing most unusual services. Mr. Herzog, formerly of the Wickwire Spencer Steel Co.'s Buffalo plant, has been in Russia for three years. His designation is based on the reduction in costs of production which Mr. Herzog was able to accomplish.

Here and There In Industry

OGLEBAY-NORTON & CO., Cleveland, announce the appointment of Bauer-Wilson Co., 310 South Michigan avenue, Chicago, as sales representatives for Rockdale ferro-phosphorous, Wrigley semicold blast furnace charcoal pig iron, and all grades of Kentucky-Illinois fluorspar.

□ □ □

Kalman Steel Corp. has transferred its Milwaukee district sales office from the Guaranty building to suite 1204 in the Warner building, 212 West Wisconsin Avenue.

□ □ □

Southern Ornamental Iron Works, Arlington, Tex., has opened a sales office in the First National Bank building, Fort Worth, Tex., in charge of William V. Brandt.

□ □ □

Monessen Foundry & Machine Co., Monessen, Pa. suffered loss by fire April 22 estimated at more than $35,000.

□ □ □

American Cyanamid Co., New York, has appointed the Case Hardening Service Co., Cleveland, its exclusive distributor in northern Ohio for hardening materials.

□ □ □

William B. Pollock Co., Youngstown, O., manufacturer of steel plate construction, has appointed Presley Hamilton, 149 Broadway, New York, room 2210, its sales representative in that district.

□ □ □

W. F. Robertson Steel & Iron Co., with plants at Cincinnati and Springfield, O., has bought the assets of the McSavaney Corp., Springfield, O., manufacturer of illuminated signs, as an added line of manufacture.

□ □ □

Frick-Reid Supply Corp., Pittsburgh, has been appointed representative by the Richards-Wilcox Mfg. Co., Aurora, Ill., for sale of the latter's Over-Way division products of trolley and I-beam conveying systems.

□ □ □

John Van Range Co. has been formed at Cincinnati by members of the Edwards Mfg. Co. Inc., Cincinnati, as a separate corporation. The plant of the former John Van Range Co. at Oakley, a suburb, will be used for the present with probable concentration in the Edwards plant later.

□ □ □

Western Wire Products Co., St. Louis, has moved from 324 South Third street to larger quarters at 1415 South Eighteenth street. Additional equipment has been installed for the manufacture of bed springs, cotter pins and other wire products. Albert V. Bauman is president and general manager.

□ □ □

Bonney Forge & Tool Works, Allentown, Pa., has appointed D. H. Skeen & Co., Chicago, its distributor for its weldolets and thredolets in the Chicago district. Stock will be carried.

□ □ □

Poole Foundry & Machine Co. has been organized to conduct the former business and plant of the Poole Engineering & Machine Co., with general and works at Woodberry, Baltimore. F. T. Brady is president, F. T. Brady Jr. vice president, and L. M. Ricketts secretary and treasurer.

□ □ □

Roots-Connersville-Wilbraham, Connersville, Ind., has made several changes recently in addresses of representatives: E. A. McCallum has moved from Los Angeles to room 620 Hearst building, San Francisco; B. T. Ehrman is now at 3300 Morganford road, St. Louis; C. B. Coldwell has moved to 307 Southland Life Insurance building, Dallas, Tex. New York and Chicago offices are at the previous locations.

□ □ □

Wickwire Spencer Steel Co., New York, has been granted a license by the American Cable Co. to manufacture preformed wire rope under the American Cable Co.'s patents. Other companies licensed to make this type of wire rope include: American Steel & Wire Co., Broderick & Bascom Co., E. H. Edwards Co., Hazard Wire Rope Co., Macwhyte Co., Pacific Wire Rope Co., General Cable Corp. and the Wire Rope Mfg. & Equipment Co.

□ □ □

Charles L. Jarvis Mfg. Co., Gildersleeve, Conn., has been formed by merger of the Charles L. Jarvis Co. Inc., manufacturer of tapping devices, chucks, stud setters and screw drivers, and the Biax Flexible Shaft Co. Inc., 22-14 Fortieth avenue, Long Island City, N. Y., manufacturer of flexible shafting and allied machinery. The Biax plant has been moved to Gildersleeve, a service and sales department being maintained at the former address.

□ □ □

Standard Steel Works Co., Burnham, Pa., producer of forgings, rolled wheels, tires, flanges, railway springs and steel castings, has completed installation of a sand conditioning and sand distribution system, furnished by Jeffrey Mfg. Co. A rearrangement of equipment and addition of a number of Herman pneumatic molding machines permits production of castings with practically no handling of sand by hand. Installations of lathes, boring mills and other equipment have also been made for the machining of forgings, flanges, driving wheel centers and other products.

MIRRORS of MOTORDOM

DETROIT

IT LOOKS like a runaway market for Ford. As in 1928 with Model A, the new eight and four have captured the public imagination, the times put a premium on low initial cost, and Ford consequently is beginning to distance the field.

In the last half of May tremendous strides have been made at the Rouge, where employment now approximates 80,000. Some departments are on three 8-hour shifts; practically all departments are operating 5 days a week. Last week noteworthy expansion was reported at branch assembly plants at Columbus, O., Omaha, Nebr., Pittsburgh, Cincinnati and Denver.

A single day's production at the Rouge has crossed 3500 units, of which almost one half were the eight. For May the goal was an average daily output of 2000 of both models daily. The tentative schedule for June is 4500 units daily. Thus far 25,000 of the new models are understood to have been delivered.

Need 90-Mile Speedometer

May production by Ford probably was almost 60,000 units. The June schedule calls for close to 90,000. On this basis, Ford must use about 30,000 tons of steel in addition to that made in his own steelworks. Recently Ford has gone outside his regular sources for wide sheets. Incidentally, Chrysler is out for third-quarter material and Hudson-Essex is expected to buy soon for its new light four.

The Ford four is going better than was expected, considering that publicity emphasis and dealer effort have largely been upon the eight. The $50 differential is one reason; some experienced buyers, while conceding that the design of the eight is admirable, invariably defer buying a new model until it has been on the road a year.

The first Ford eights were equipped with a speedometer with an 80-mile top, but since there is more than the 80 miles in the new engine, a 90-mile unit is now standard.

Ford Scans Transmission

Mr. Ford is reported to be greatly interested personally in a special type of transmission which is not standard inbuilt free wheeling but rather an automatic declutching device, somewhat similar to the Buick control and the type now offered as optional equipment by Hudson-Essex. A good many hours has Mr. Ford spent over the drafting board on this transmission. It will be recalled that when the new type malleable brake assembly was adopted for the new eight and four it was designed sufficiently generous for free wheeling or the equivalent.

This surge by Ford has created an extremely unbalanced situation in the industry. High and medium-price manufacturers have further curtailed, with the exception of Chrysler and Dodge. Cadillac-LaSalle continues down, and some manufacturers, like Buick, appear to be building up an inventory in anticipation of a shutdown. Some of these manufacturers probably will be down until they begin production of their next series.

The initial Chevrolet schedule for June is for about 35,000 units, contrasted with 50,000 to 55,000 made in May. Some Chevrolet departments operated only three days last week. Plymouth holds rather steadily to close to 2000 units daily, or about 20,000 a month. In general, those material suppliers not getting a good share of the Ford business have found May considerably worse than April.

Ford has blown out a blast furnace stack, and is melting more scrap and cold iron. The independent steelmaker in the Detroit area, operating far stronger than the average for the entire steel industry, is building up a stock of ingots as well as supplying considerable material to Ford and to the Murray Body frame plant, which is operating heavily.

General Motors continues to plan for a most vigorous campaign for next year, and while its program necessarily still is in the formative state, some changes in policy are readily apparent.

Most radical, probably, will be a redesign of Buick, Olds and Pontiac bodies. Through the entire General Motors line, from Cadillac to Chevrolet, a degree of sameness in bodies has been becoming more pronounced. This has effected marked economies in dies, but has not stimulated sales.

The new B-O-P unit (Buick, Olds, Pontiac) appears determined that its 1933 lines will strike an entirely different note in each price class.

Chrysler Four Near?

There appears to be more substance to the report that General Motors will bring out a low-price six and a low-price eight, to a large extent the engines being identical with the present Chevrolet and Pontiac units, but with bodies and engines stripped of all gadgets. It is realized that while Chevrolet is a good value, the Ford eight presents a new type of competition. Twice before has Chevrolet been confronted with the same problem, and both times has it come through.

Next to Ford, the Chrysler situation is the happiest. Plymouth, as noted, holds rather closely to 2000 a day; DeSoto is receiving wide recognition as being an extremely smart car; Dodge bodies will be revamped to improve their lines.

The Chrysler organization has whipped a four into shape, presum-

ably to sell lower than the Plymouth and to compete with the Ford four. There is some reason for believing that this four may be brought out in the DeSoto line, now exclusively a six.

The Essex new pacemaker series is the current line stripped of its gadgets, resembling the Plymouth "thrift" line. Hudson-Essex still is understood to have a low-price four ready for the production line.

If the present experimental work on extremely low-price cars is carried through, General Motors will have a six and an eight, and Hudson-Essex and Chevrolet each a four in this class, in addition to the present Ford four. Only a fraction of experimental work eventuates, but the times favor low-price cars.

Obituaries

LEON E. YOST, open-hearth superintendent of the Corrigan, McKinney Steel Co., Cleveland, since the plant was built in 1916, died May 22. Previously he had been associated with the Gary, Ind., works of the Illinois Steel Co. and the former Upson Nut Co., Cleveland. Mr. Yost, who was noted for the high quality of steel produced by his department, was 58, and had been ill only a week.

□ □ □

John W. Richards, chemist and assayer of Denver and a member of the American Institute of Mining and Metallurgical Engineers, died May 18. He was 76.

Japan's Scrap Takings Lift April Exports; Imports Fall

EXPORTS of iron and steel from the United States in April at 58,118 gross tons showed an increase of 16.6 per cent over March and were the heaviest thus far in 1932, owing largely to Japan's purchases of iron and steel scrap, states the iron and steel division, department of commerce, Washington.

Imports, at 36,339 gross tons, were 11.4 per cent smaller than in March, due largely to decreased receipts of pig iron. April did develop a marked increase in imports of tin plate, these rising from 26 tons in February to 2529 tons in March to 4151 tons in April.

In four months of 1932, exports have totaled 189,197 gross tons, compared with 394,638 tons a year ago. Imports thus far in 1932 have totaled 135,161 tons, against 157,947 tons a year ago. The favorable balance of trade in 1932 thus is 54,036 tons, compared with 236,691 tons a year ago.

April imports of pig iron were only 9848 tons, against 18,829 in March. A slight decrease also was shown in concrete bars, receding from 3189 tons in March to 2650 tons in April. Slight gains were made by ferromanganese, sheets, structural shapes and hoops and bands, in addition to tin plate previously mentioned.

FOREIGN TRADE OF UNITED STATES IN IRON AND STEEL

Gross Tons

	1932		1931	
	Imports	Exports	Imports	Exports
Jan.	31,053	40,660	41,628	92,719
Feb.	26,738	40,492	28,045	91,161
March	41,031	49,927	40,402	109,324
April	36,339	58,118	47,872	101,434
(4 mo.)	135,161	189,197	157,947	394,638
May	.....	.....	37,176	95,046
June	.....	.....	37,819	75,577
July	.....	.....	37,190	84,465
Aug.	.....	.....	30,139	73,338
Sept.	.....	.....	30,966	69,778
Oct.	.....	.....	29,401	59,335
Nov.	.....	.....	34,658	59,556
Dec.	.....	.....	25,812	57,263
Total	.....	.....	421,108	968,996

IMPORTS OF IRON AND STEEL PRODUCTS

Gross Tons

Item	April 1932	March 1932	April 1931
Pig iron	9,848	18,829	14,479
Sponge iron	.....	51	1
Ferromanganese, spiegel (1)	2,510	1,557	2,253
Ferrochrome (2)	49	.....	35
Ferrosilicon (3)	.....	.....	77
Other ferroalloys	289	.....	201
Scrap	532	507	1,333
Ingots, blooms, billets, etc.	88	368	1,904
Concrete bars, etc.	2,650	3,189	4,934
Hollow bar, drill steel	78	98	142
Merchant steel bars	3,331	3,529	4,554
Iron slabs	.....	.....	21
Iron bars	76	41	88
Wire rods	276	973	655
Boiler and other plate	51	5	61
Sheets, skelp, sawplate	2,820	1,566	1,541
Tin plate	4,151	2,529	11
Structural shapes	3,154	2,538	6,538
Sheet piling	.....	.....	366
Rails and fastenings	685	72	2,544
Cast iron pipe, fittings	12	.....	1,160
Welded pipe	578	478	403
Other pipe	200	265	805
Barbed wire	1,390	1,551	499
Round iron, steel wire	223	211	265
Telephone, telegraph wire	.....	1	1
Flat wire, strip steel	84	59	62
Wire rope, strand	202	146	209
Other wire	112	23	63
Hoops and bands	1,889	1,454	1,921
Nails, tacks, staples	995	930	508
Bolts, nuts, rivets	11	7	46
Horse, mule shoes	2	4	.....
Castings, forgings	53	50	192
Total	36,339	41,031	47,872

(1) Manganese content.
(2) Chromium content.
(3) Silicon content.

ORIGIN OF APRIL IMPORTS

Gross Tons

	Iron ore	Pig iron	Manganese ore	Ferromanganese
British India	.....	5,564	.....	.....
Canada	80	28	.....	.....
Chile	21,652	.....	.....	650
Soviet Russia	32,710	.....	5,136	.....
United Kingdom	598	3,900	15	669
Cuba	22,000	.....	.....	.....
Algeria, Tunis	6,375	.....	.....	.....
Netherlands	.....	50	282	.....
Brazil	.....	.....	3,930	.....
Sweden	7,037	156	.....	.....
Gold Coast	.....	.....	4,670	.....
Norway	.....	.....	.....	1,149
Other Countries	1	150	2	42
Total	90,435	9,848	14,062	2,510

Exports of scrap in April, largely to Japan, totaled 19,047 tons; 13,256 tons in March. Slight increases also were shown in steel bars, boiler plates, black sheets, tin plate, rails and steel pipe.

Largely on account of Japan's scrap purchases, the Far East took 29,769 tons of iron and steel from the United States in April, compared with only 19,612 tons in March. American trade with Africa, Europe, South America and Canada was largely unchanged.

EXPORTS OF IRON AND STEEL PRODUCTS

Gross Tons

Item	April, 1932	March, 1932	April, 1931
Pig iron	221	175	286
Ferromanganese, spiegel	8	.....	1
Scrap	19,047	13,256	15,667
Ingots, blooms	107	186	218
Iron bars	43	68	87
Steel bars	1,846	1,364	3,897
Alloy steel bars	76	327	291
Wire rods	1,178	2,733	3,239
Boiler, other plates	1,653	1,237	5,112
Skelp	954	2,319	3,603
Iron sheet, galvanized	141	182	333
Steel sheets, galvanized	2,425	2,513	4,435
Steel sheets, black	4,534	3,135	10,904
Iron sheets, black	501	242	1,382
Hoops, bands, strip	1,743	2,127	3,148
Tin, terne plate	4,460	2,336	8,753
Water, oil, gas, other tanks, except lined, etc.	246	557	1,266
Shapes, not fabricated	1,728	2,000	9,066
Shapes and plates, fab.	859	920	3,800
Metal lath	90	174	343
Frames, sashes, piling	533	319	659
Rails	1,216	822	4,117
Rail fastenings	197	730	689
Boiler tubes	198	243	998
Casing and oil-line pipe	685	2,105	2,297
Seamless black pipe, other than casing (1)	79	67	.....
Malleable - iron screwed pipe fittings	139	155	487
Cast - iron screwed pipe fittings	64	73	261
Cast - iron pressure pipe and fittings	2,188	51	2,319
Cast-iron soil pipe and fittings	758	251	590
Welded black, galv. steel pipe	2,938	2,054	4,020
Welded black, galv. wrought pipe	1,064	305	375
Riveted pipe, fittings (1)	20	2	.....
Plain black or galv. wire	1,117	1,397	1,506
Barbed wire, woven-wire fencing	2,293	2,562	2,639
Woven-wire screen cloth	68	56	84
Wire rope	141	145	279
Insulated wire and cable	58	34	9
Other wire and manufactures	160	204	434
Wire nails	781	615	810
Tacks	32	36	50
Other nails, including staples	355	412	310
Bolts, machine screws, nuts, rivets, and washers	224	266	581
Iron castings	235	106	464
Steel castings	111	138	189
Car wheels and axles	306	385	716
Horseshoes	1	2	3
Forgings	297	541	717
Total	58,118	49,927	101,434

(1) Not shown prior to 1932.

EDITORIAL

Revamping America Means Work for Industry

TO EXAGGERATE is a common trait. In 1930 most of us were too optimistic on the ability of the country to stage a rapid recovery. Today we are prone to be too pessimistic about the future. The phrase, "Prosperity will not return during my lifetime" rolls off the tongue too readily.

Discounting the future is not a new fault. It is prevalent in every depression. It was practiced in 1921. On Aug. 4 of that year—in the blackest hour before the dawn—this publication presented a "normal" line showing the expected future growth of production of steel ingots and castings according to the calculations of Col. Leonard P. Ayres. When projected eight years into the future, the line indicated a "normal" output in 1929 of 55,927,000 gross tons. To observers in 1921 this great tonnage seemed improbable if not impossible, yet when the actual production for 1929 was compiled, it was found to be 56,433,473 tons—roughly 500,000 tons in excess of the calculated "normal."

Several days ago Colonel Ayres was invited to construct a new "normal" or "regression" line based on the production experience of 33 years, or from 1896 to 1929 inclusive. It appears in the article on page 11 of this issue. In the light of the present business outlook the "normal" tonnage for future years indicated by this line seems fantastically high, yet sometime in the future actual production will exceed the "normal" just as it did in 1929.

Country Cannot Continue Long on 1900 Rate of Steel Output

If you are reluctant to put faith in this regression line, which is a mathematical device used by statisticians, consider the future from the standpoint of per capita production. Output of steel ingots and castings in the first four months of 1932 was at the rate of 17,000,000 gross tons annually. With an estimated population of 125,000,000 this is an annual output of 300 pounds per capita.

The most recent previous year in which the nation managed to get along on 300 pounds of steel per person was 1900, when the population was only 75,995,000. At that time the skyscraper was in its infancy; only a few automobiles were in existence; the tonnage of steel in pipelines was small; wood was still the predominant material in railroad car bodies; concrete roads reinforced with steel were practically unknown; and refrigerators, filing cabinets, office furniture, barrels and drums, radios, gasoline cracking stills, chemical equipment, airplanes, hangars and numerous other articles of steel were either unknown or of negligible importance. In the face of these facts, can we conceive of the country continuing for more than a very limited period at the 1900 per capita rate?

The present situation in consumption may be likened to the flow of a brook dammed by a fallen tree. Debris lodges in the branches until the flow is reduced to a mere trickle. Meantime a reservoir of water forms behind the barricade, and when the pressure becomes great enough the tree is swept aside and the water released.

Reservoir of Demand Is Backing Up Behind Dam of Depression

If we will look around we will see a great reservoir of tonnage forming behind the dam of depression. Idle locomotives, cars, cranes, presses, mills, machine tools and equipment of all kinds have been stripped of parts to keep active units in operation. Plants in which one or two parallel sets of machinery or parts normally were held in reserve for emergency now have nothing in reserve. Everywhere the stripping of plant and equipment to avoid the use of working capital is piling up a potential demand for the future.

We find it easy to believe that our country is overbuilt in buildings and structures, but we overlook the replacement factor. The proper housing of the families of low-wage workmen presents a social problem that has been long neglected and offers a market for materials, including steel, which has possibilities equal to that of the automobile industry. The redistribution of population to meet new economic conditions will involve the practical abandonment of entire towns and villages, revamping of large sections in cities, and new construction greater in volume than anyone has yet anticipated.

If this country were mature in age, stable in development and static in population, we would be justified in viewing the future with concern. But it is a young country. Like an adolescent youth, it still is crude, awkward and ungainly. The work to be done in developing and refining it and in restoring the facilities for food, shelter, transportation, education, and recreation to the proper balance to insure comfortable living for our millions of inhabitants will impose on industry demands for its products far in excess of anything the nation has yet witnessed.

THE INDUSTRIAL DIAL

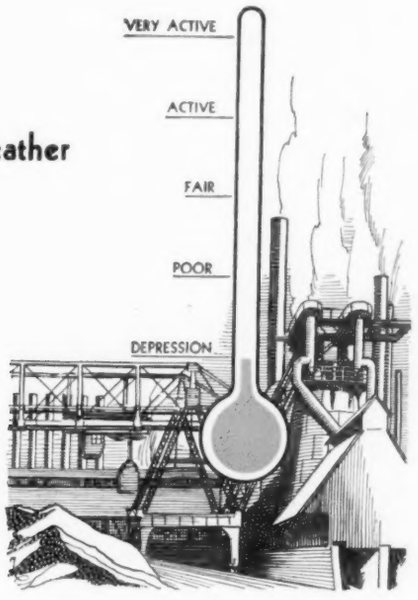
Published in the last issue of each month as part of
The Business Trend Section of STEEL
Copyright 1932 by Penton Publishing Co.

BALANCING the ledger of business for May is difficult because there is no clear-cut evidence of improvement or marked recession.

Slight betterment in a number of industries was offset by unfavorable developments in others. In general prices dropped to lower levels, but there were exceptions in several important commodities. The condition of banks was decidedly better, yet the continued drastic liquidation of securities partly obscured the real effect of credit liberalization. The entire business situation is clouded by the haze of numerous intangible factors.

It is possible to place a finger on several definite favorable developments. Steelworks operations gained several points during the month, but suffered a slight relapse in the final week. Automobile production in May probably will be found to exceed that of any month since last August. This is due almost entirely to the activity of manufacturers of three low-priced cars. The petroleum industry continues to improve its position through restriction of production and by virtue of a stable price situation. Here and there throughout industry are other minor signs of improvement.

Industrial Weather



TREND:

Uncertain

Business Waits on Congress

But with these exceptions the general picture of industry is drab. Car loadings have slipped to a level in the week ending May 14 which is the lowest since the week ending Jan. 2. Business failures were mounting as the end of May drew near.

Sentiment now is responsive more to the ebb and flow of activity in Washington than to the trend of business. During the month congress has given signs that it wants to heed the public's mandate for a balanced budget. But the lure of politics still is a bar to decisive action. The senate is messing up the tax bill almost as hopelessly as did the lower house. The longer the present quibbling goes on, the more likely will be the prospect of a last minute switch to the sales tax as the easiest way out of an impasse.

Danger Lurks in Relief Problem

Meanwhile the problem of relief is coming to the front. Here the conflict is between those who want to throw billions of dollars into public projects (without much care as to what the projects are) and those who want to limit the extension of funds to work that is "self-liquidating." The administration favors the latter plan, which from the standpoint of business seems less open to political abuse.

Until the budget and relief problems are settled, industry will be forced to mark time at the present discouraging tempo.

Where Business Stands

Monthly Average, 1931 = 100

	April 1932	March 1932	April 1931
Steel Ingot Output	59.6	65.3	130.8
Pig Iron Output	57.0	61.8	133.9
Freight Movement	77.4	79.6	104.3
Building Construction	45.5	55.5	125.8
Automobile Output	75.1	61.8	171.9
Wholesale Prices	78.9	81.6	101.7

Business Trend Charts of the Month

Production
Steel ingot production ..... May 16, p. 26
Pig iron production ..... May 16, p. 25
Industrial production ..... May 2, p. 29

Demand
Unfilled orders, U. S. Steel Corp. ..... May 16, p. 23
Railroad car orders ..... May 16, p. 26
Index of machine tool orders ..... May 23, p. 26
Building construction ..... May 30, p. 21
Automobile production ..... May 9, p. 29

Prices
Bradstreet's index of commodity prices ..... May 16, p. 25
Iron and steel price index ..... May 2, p. 29; May 9, p. 28; May 23, p. 23; May 30, p. 22

Miscellaneous
Foreign trade ..... May 30, p. 22
Freight traffic ..... May 2, p. 30; May 9, p. 29; May 23, p. 25; May 30, p. 21
Commercial failures ..... May 23, p. 25
Iron and steel imports and exports ..... May 2, p. 30
Monthly railroad earnings ..... May 23, p. 26

Thumb Nail Sketches Of Business

New construction contracts in 37 eastern states from May 1 to May 14 inclusive totaled $63,079,100, according to the F. W. Dodge Corp. The comparable figure for the first half of April was $58,169,600. Of the total for two weeks in May $32,346,200 represents public works and public utilities, $17,945,100 non-residential building and $12,787,800 residential building.

Japan Takes More U. S. Steel

Exports of iron and steel products in April totaled 58,118 tons, a gain of 16.6 per cent. Imports dropped to 36,339 tons, a los sof 11.4 per cent. Of the exports Japan took 18,903 tons and Canada received 13,874 tons. The principal increases in exports were in scrap, cast iron pipe and tinplate.

Depreciated Sterling and Prices

Poor's analytical service points out that from Sept. 18 to Apr. 20, 1932, commodity prices in England gained only 3.8 per cent while sterling had depreciated 22.6 per cent. Meantime in the United States, where the gold standard was maintained, commodity prices fell 5.2 per cent in the same period.

Peak of Steel Activity Later?

The high points in weekly steelworks operations during the past four years reveals interesting comparisons. In 1929 the peak was about May 1, in 1930 it was on March 1 and in 1931 it was March 19. Thus far in 1932 the highest points were 28 per cent, on Jan. 30 and Feb. 6 and 13, and 25½ per cent on May 21. Considering the low rate prevailing in the first five months of this year, it is quite possible that the crest of activity may occur in the summer or fall months—an unusual situation.

Why Congress Should Hurry

Indicative of the need of prompt action on the budget, U. S. treasury income to May 25, 1932 was about $1,724,000,000 against $2,603,000,000 a year ago. Current outgo over income is $2,611,000,000 compared with $973,000,000 this time last year.

Why Commercial Companies Fail

Bradstreets' has analyzed the causes of the 10,932 business failures it has reported for the first four months of 1932. Over half are attributed directly to the depression. The complete analysis follows:

	No.	Per cent of total
External causes:		
Undue competition	169	1.5
Unfavorable circumstances (depression)	6,356	58.2
Complication of indebtedness	104	0.9
Internal causes (non-culpable)		
Incompetence	1,142	10.5
Inexperience	207	1.9
Undertaking too much business for capital employed	2,692	24.6
Granting credits recklessly	121	1.1
Internal causes (culpable)		
Personal extravagance	28	0.3
Neglect of business	49	0.4
Speculation outside of legitimate business	13	0.1
Fraudulent disposition of property	51	0.5
	10,932	100.0

The Barometer of Business

Industrial Indicators

	April, 1932	March, 1932	April, 1931
Pig iron output (Daily average, tons)	28,524	31,194	66,986
Machine Tool Index	37.1	43.1	102.1
Unfilled orders (tons)	2,326,926	2,472,413	3,897,729
Ingot output (Daily average, tons)	47,685	52,253	104,711
Dodge Bldg., awards in 37 states (sq. ft.)	13,886,600	16,924,200	39,380,300
Automobile output	154,823	127,277	354,098
Coal output, tons	20,300,000	32,320,000	28,478,000
Business failures; number	2,816	2,951	2,380
Business failures; liabilities	$101,068,693	$93,760,311	$50,860,000
Cement production, Bbls.	4,847,000	3,971,000	8,245,000
Cotton consumption, bales	367,280	488,655	508,691
Car loadings (weekly average	554,578	570,150	746,417

Foreign Trade

Exports	$136,000,000	$155,254,000	$215,077,000
Imports	$127,000,000	$131,292,000	$185,706,000
Gold exports	$49,509,000	$43,909,000	$27,000
Gold imports	$19,033,000	$19,238,000	$49,543,000

Financial Indicators

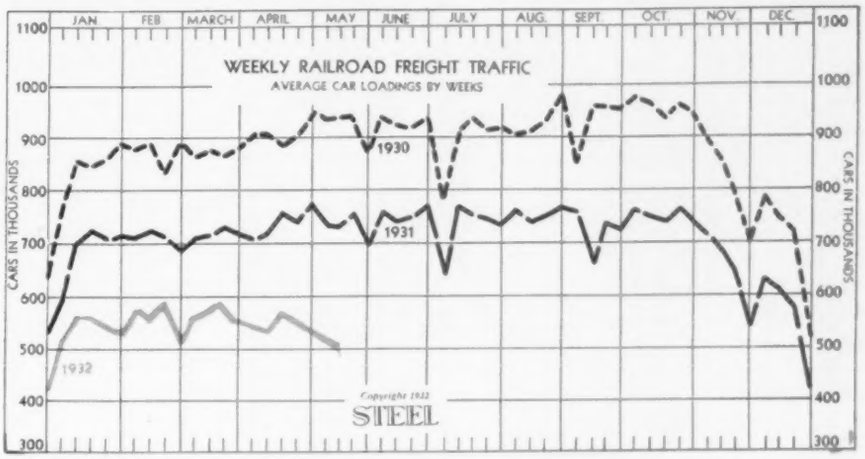
	April, 1932	March, 1932	April, 1931
25 Industrial stocks	$93.43	$116.39	$218.88
25 Rail stocks	$18.88	$26.94	$75.87
40 Bonds	$61.94	$66.97	$83.57
Bank clearings (000 omitted)	$22,534,684	$24,214,435	$39,337,909
Commercial paper rate N. Y., per cent)	3½	4	2½
*Commercial loans (000 omitted)	$6,779,000	$6,883,000	$8,001,000
Federal Reserve ratio, per cent	69.3	70.9	84.0
Railroad earnings	$32,289,300	$22,042,614	$46,478,184
Stock sales, N. Y. stock exchange	31,402,988	33,060,518	54,333,243
Bond sales, par value	$254,182,750	$252,683,200	$223,968,000

*Leading member banks Federal Reserve System.
**March, February and March, respectively.

Commodity Prices

	April, 1932	March, 1932	April, 1931	Monthly aver. 1913
STEEL's composite average of 14 iron and steel prices	$29.75	$29.61	$31.59	$26.32
Bradstreet's index	$6.91	$7.15	$8.91	$9.21
Wheat, cash (bushel)	73c	71c	97c	92c
Corn, cash (bushel)	49c	49c	77c	51c
Petroleum, crude (Bbl.)	90c	90c	57c	$2.50

Freight	1932	1931
May 14	517,667	747,057
May 7	533,677	745,740
Apr. 30	554,012	774,742
Apr. 23	562,380	758,503
Apr. 16	566,729	759,494
Apr. 9	544,806	737,934

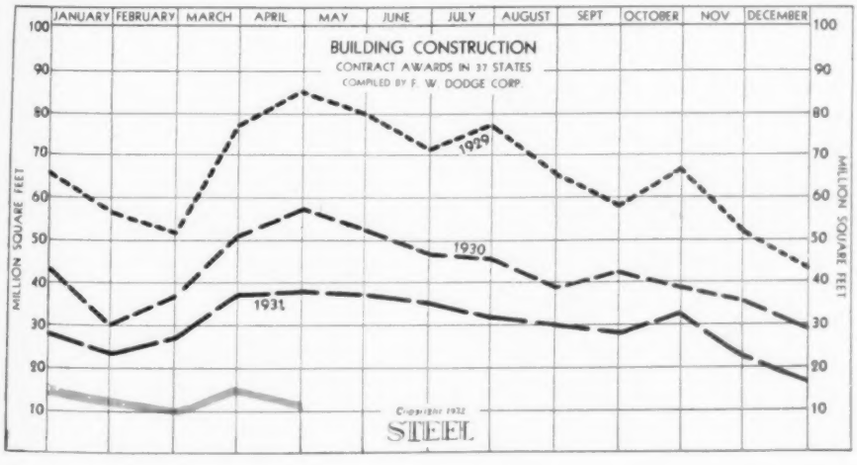


Freight Car Loadings Fall To New Low For This Year

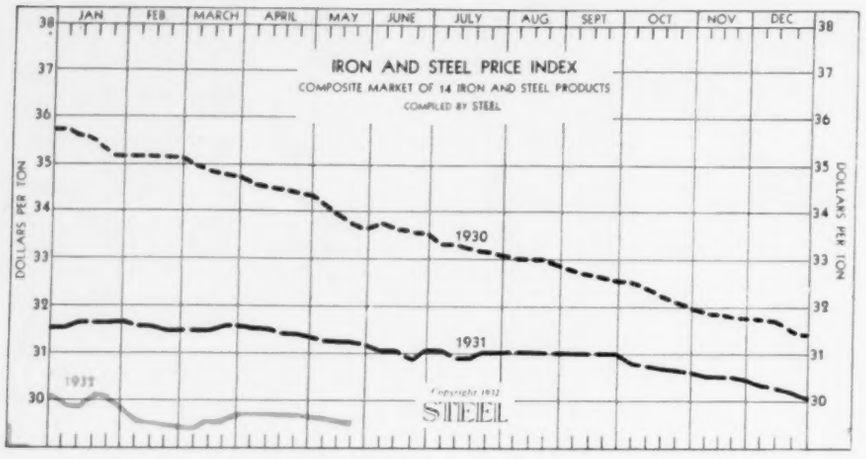
Loadings of revenue freight for the week ending May 14 totaled 517,667 cars. According to the weekly statistical report compiled by the American Railway association, this is the lowest volume of cars loaded thus far this year. The current figure represents a decline of 16,010 cars compared with the movement in the preceding week and was 229,390 cars less than were moved in the same week of 1931. Decreases from the preceding week were reported for all classes of freight with the exception of ore, which registered a gain of 400 cars. Loading of miscellaneous freight accounted for 192,563 cars while in the western districts loading of grain and grain products totaled 17,192 cars.

Value of Building Awards Is Higher; Area Less in April

Although the value of construction awards in 37 eastern states in April was higher than in March, the volume measured in square feet of new floor space was lower. The area represented by April awards, as reported by the F. W. Dodge Corp., was 13,886,600 square feet, as compared with 16,924,200 square feet in March and with 39,380,300 in April last year. Awards for the first four months of 1932 totaled 55,710,600 square feet as compared to 130,308,300 in the same period in 1931. The valuation of construction contracts awarded in the month of April totaled $121,704,800 and compared with $112,234,500 in March and $336,925,200 for April last year.


JANUARY FEBRUARY MARCH APRIL MAY JUNE JULY AUGUST SEPT OCTOBER NOV DECEMBER
BUILDING CONSTRUCTION
CONTRACT AWARDS IN 37 STATES
COMPILED BY F. W. DODGE CORP.
100 90 80 70 60 50 40 30 20 10
MILLION SQUARE FEET
1929
1930
1931
Copyright 1932
STEEL

	Square Feet
April, 1932	13,886,600
March, 1932	16,924,200
April, 1931	39,380,300



Prices	1932	1931
May 21	$29.58	$31.37
May 14	29.64	31.37
May 7	29.68	31.40
Apr. 30	29.70	31.49
Apr. 23	29.74	31.51
Apr. 16	29.74	31.59

Steel Prices Are Steady, But Raw Materials Uncertain

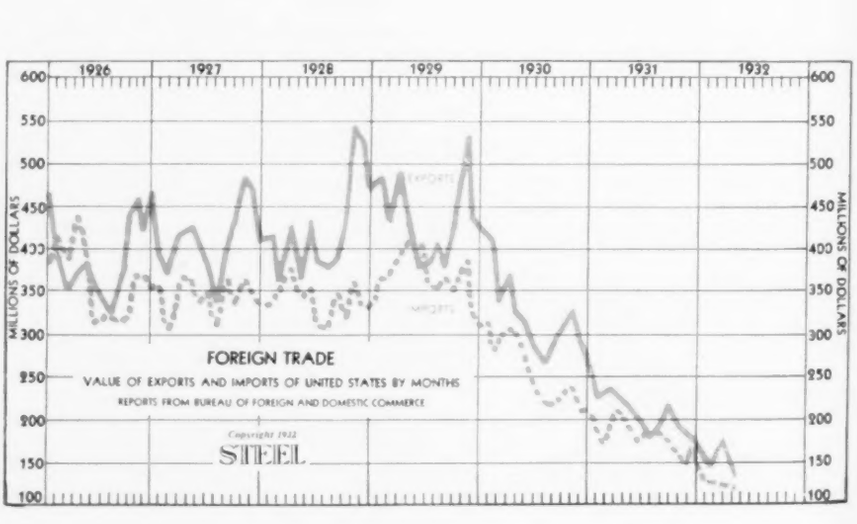
Iron and steel prices continue to show steadiness in spite of low demand. STEEL's composite of iron and steel prices stands at $29.58—a figure almost identical with that of three months ago. During that interval strength in finished steel prices developed but in the meantime adjustments in pig iron have served to restore the barometer to its February level. STEEL's composite of finished steel prices has not changed since the last week of March. During recent weeks softness in raw materials has been emphasized in pig iron, coke and scrap. With few exceptions finished steel prices are well stabilized and advances in several products for third-quarter are hinted.

April Trade Balance Shrinks As Exports and Imports Drop

Merchandise exports and imports of the United States in April dropped sharply from March levels. According to the bureau of foreign and domestic commerce, exports in April were valued at $136,000,000, compared to $155,254,000 in March and $215,077,000 for April last year. Export business last month showed more than the usual seasonal decline and can be accounted for by a shrinkage in foreign demand for raw cotton. April imports at $127,000,000 were the smallest since the February, 1915, total of $125,100,000. March imports were valued at $131,292,000 and in April last year imports totaled $185,706,000. The favorable balance of trade declined to $9,000,000.

Exports	
April, 1932	$136,000,000
March, 1932,	155,254,000
April, 1931	215,077,000

Imports	
April, 1932,	$127,000,000
March, 1932	131,292,000
April, 1931	185,706,000



Four-Ton Coreless Induction Furnace Installed

BY DUDLEY WILLCOX

Treasurer and Assistant General Manager,
Ajax Electrothermic Corp., Trenton, N. J.

Fig. 1—Four-ton coreless induction furnace in pouring position

SEVEN years ago there was installed the first coreless induction furnace of commercial size operating from a high-frequency generator of standard salient pole type. In the intervening years some 30,000 kilowatts have been started, for the most part in 100 to 600 kilowatt units, operating brass and steel melting furnaces of 100 to 2000 pounds capacity.

During the fall of 1931 in the Chicago district a 4-ton coreless furnace was placed in operation, capable of melting 40 to 50 tons per day. This is almost double the size of any coreless melting furnace previously installed. The main purpose is to melt low-carbon corrosion-resisting steel scrap, also ferroalloys for addition to larger furnaces and metal for ingots of high quality tool steel and other alloys. The novel features of this equipment are here first described.

For those not familiar with the principle of the coreless induction furnace, it may be explained that it is essentially an air transformer whose primary is a single layer helix of water-cooled copper tubing and whose secondary within the coil is a conducting mass which in the furnace here described, constitutes the charge to be melted. Induced currents circulate in the outer part of the charge, and thereby heat it. No electrodes are used. The charge is stirred as much or as little as desired by electrical forces within the bath. The melting can be accomplished rapidly and with little wear on the furnace lining. No elements in the charge are likely to be volatilized because no part of the furnace is hotter than the bath, and the temperature can be controlled closely by regulating the power input.

Fig. 4 shows the general layout of the component parts of the equipment. The generator is in a separate building. It may be placed at any convenient distance from the furnace and capacitors. In the case of another installation, the generator is placed 600 feet from the furnace.

A simplified wiring diagram, Fig. 2, indicates the essentials of the electrical circuit. The charge is called, for convenience, the susceptor.

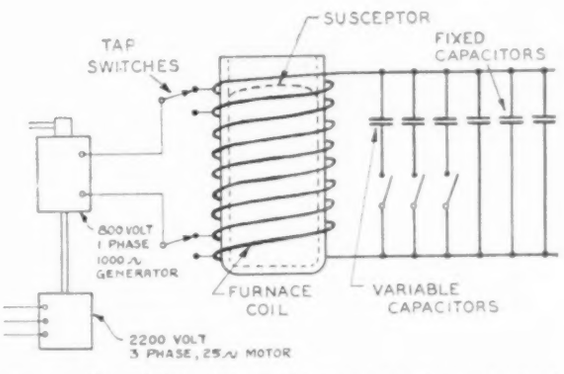


Fig. 2—Simplified circuit diagram showing principal components of coreless induction furnace installation. "Susceptor" indicates charge of metal

The furnace, tilted for pouring, is illustrated in Fig. 1. The construction differs from that of all previous furnaces of this type in that the coil and hearth, with space around them, are supported on structural steel beams attached to the sides of the case near the bottom. This is clearly shown in outline drawings, Fig. 3. Any molten

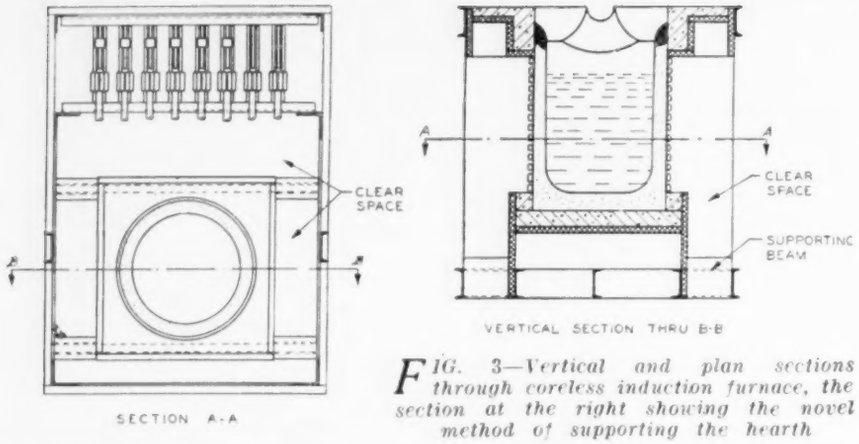


FIG. 3—Vertical and plan sections through coreless induction furnace, the section at the right showing the novel method of supporting the hearth

metal which may accidentally leak through should fall into a pit below the furnace, thus reducing the danger of serious injury to the furnace casing. A spare furnace now being installed will provide for complete continuity of operation.

The furnace case is of structural steel shielded inside with sheet copper. Previously made furnaces have been constructed with asbestos board sides and brass frames. The 4-ton furnace operates with a temperature rise in the housing of only a few degrees, and then only where it comes closest to the coil.

New Refractory Material

The lining is rammed in about an asbestos shell as described in STEEL May 2, p. 36, and June 4, 1931, p. 39, by Dr. E. F. Northrup, vice president and technical adviser, Ajax Electrothermic Corp. A new refractory material known as Almag is used. This is a mixture of magnesia and alumina of suitable grain sizes. Lining life is reported as satisfactory, in the melting of USS 18-8 steel and other high-chromium alloy steels.

The charge is poured into a ladle and then is teemed into ingot molds. The electrical connections are broken when the furnace is tilted. The water connections can be disconnected for about one-half hour without boiling the water out of the coil. The furnace is tilted for pouring about an axis in line with the spout as shown in Fig. 1.

The 1000-cycle motor-generator set built by General Electric Co., Schenectady, N. Y., and shown in Fig. 5, is cooled with washed air provided by a washer installed in a room below the set. The bearings are provided with oil under pressure. The set runs at 1500 revolutions per minute and has required no repairs nor unusual maintenance. A separate switchboard is provided from which the following are controlled:

(a) Cooling water for furnace.
(b) Voltage on generator line (automatic or manual as desired).
(c) Taps on coil.
(d) Taps on condenser bank.

A bell at the top of the panel rings if the cooling air from the generator becomes overheated.

Heavy Current Carried

Banks of capacitors are required with suitable contractors for throwing capacitors in and out of circuit. Short busbars which appear in the picture are air-cooled but heavy main busbars carrying the furnace current are made of water-cooled tubing interlaced to cut down inductance. It is believed that this is the first time that the problem has been solved of carrying 12,000 amperes or over at 1000 cycles.

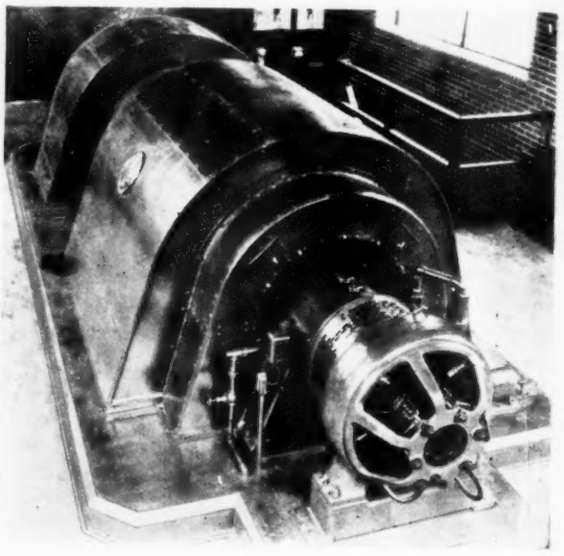


FIG. 5—MOTOR-GENERATOR set of 1250-kilovolt-ampere rating, cooled with washed air, and supplying 1000-cycle current for operating the furnace

Alloys melted in this furnace to date comprise:

USS 18-8 (18 per cent chromium, 8 per cent nickel);
USS 17 (17 per cent chromium);
USS 21 (21 per cent chromium);
USS 12 (12 per cent chromium);
A 4-6 per cent chromium steel, 0.15 per cent carbon;
Plain carbon tool steel;
A 2.5 per cent chromium steel, 1.5 per cent carbon;
SAE 4130 steel.

As yet time has not been available to check conclusively the metallurgical results. It can be said, however, that the USS 18-8 steel produced from scrap is equal to the arc furnace product.

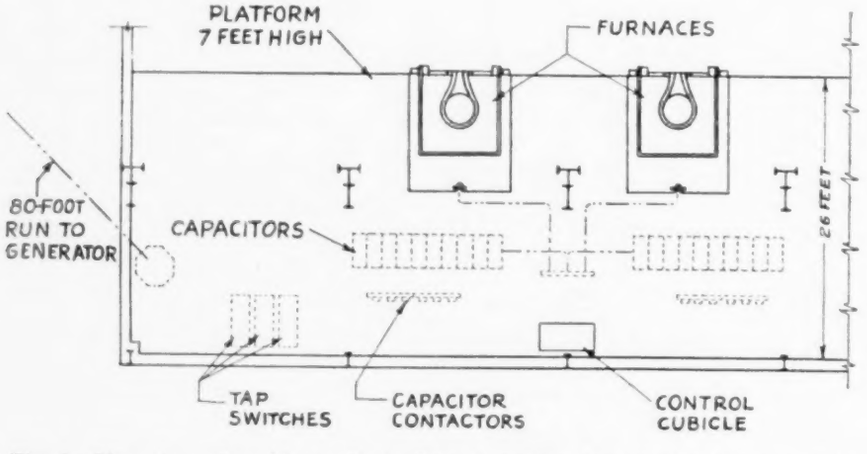


Fig. 4—Plan view of various units in 4-ton induction furnace installation. The second of the two furnaces is now being installed

Panels Made of Plied Steel And Wood Find New Uses

SHEET metals, particularly steel, are finding a new outlet through their application to a product of the Haskelite Mfg. Corp., 120 South LaSalle street Chicago. This product, known as Plymetl, is a stiff plywood panel in various sizes to which is firmly cemented a metal face or faces.

The claim is made that through its use in this product, sheet steel in general has been given wider distribution in a number of adaptations and markets that formerly were closed to it. In the marine field, for instance, where all joinery was of wood, these panels have been growing in favor for partitions and bulkheads. In addition to their light-weight strength characteristics, the panels take attractive finishes, and their steel faces are non-combustible.

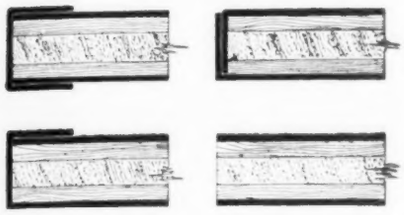


Fig. 1—To protect the plywood panels from moisture, the steel frequently is turned over the edges in one of the ways shown

This product recently was employed on the JOHN J. HARVEY, New York City's largest fireboat. Special panels with steel faces and an asbestos core for maximum fire resistance were used in crew's quarters for partitions and ceilings. For these applications, it is evident that the combination of light-gage metal with a solid backing provides greater stiffness than the corresponding weight in metal alone would permit.

Many Applications

A number of recent installations, in which highly-finished steel interior decorations were paramount, included paneling for soda fountains, restaurant counters and hospital equipment. For this work, 18-8 stainless steels, such as Enduro, Allegheny and Rezistal, are being specified. Fig. 2 shows a Chicago soda fountain installation in which was used considerable paneling faced with Rezistal KA2 corrosion-resisting steel manufactured by the Crucible Steel Co. of America. Nonferrous metals such as monel metal, Everdur, aluminum and copper also may be applied. For the more ordinary applications, copper-bearing zinc-coated steel sheets are used, stretcher-leveled to insure a glass-smooth flatness.

The material has become popular in a number of fields of transportation. Besides its adaptation for fire-resisant partitions for staterooms on ships, it is used for side panels of commercial car bodies, buses and street cars. A domestic market is found in the use of the product for clothes vaults and refrigerators, while other commercial applications include its use in bakeries for proof boxes, and in warehouses for certain types of storage vaults.

Stiffness Is Advantage

Tests have indicated that a panel, 5/16-inch thick, faced on two sides with No. 27 gage sheet steel, has approximately 50 times the stiffness and six to eight times the impact resistance of No. 16 gage sheet steel, although both panels have the same weight. Thus, because of its stiffness, Plymetl lends itself readily to the construction of vehicles. Commercial bodies have been built lighter and stronger. When this paneling is used, the design of bodies has been changed by spacing uprights at wider intervals to take advantage of its strength, as shown in Fig. 4, the interior of a large van.

The material is easily worked and finished. It can be nailed or screwed in place, or it may be riveted with cold rivets. It can be sawed with an ordinary band or circular saw. The steel faces frequently are turned over the edge to protect the panel from moisture, as shown in Fig. 1. Where curved surfaces are required, the product can be molded, the rounded front of a trailer body serving as an example. Fig. 3 shows a trailer featuring this type of design, the body being curved at the forward end.

Special Glue Used

The outstanding production feature of the material, which was developed at the close of the war, is the glue used in fastening the metal to the plywood. In its research laboratory, the Haskelite Mfg. Corp. has perfected a special gluing process. The plywood itself is glued by a special water-resistant glue. The glue is made from fibrin-free animal blood evaporated to dryness at a carefully regulated temperature in order to keep the percentage of insolubles at a point as low as possible.

As it is received at the Haskelite plant in Grand Rapids, Mich., the veneer contains minor defects which were present in the log or have resulted from careless cutting and it is necessary that these defects be cut out. This is done by means of large clippers, which trim each piece to a width that is free from defects and to one of a set of standard lengths. After clipping, the veneer is jointed, sorted and laid up to required sizes, and taped when necessary. The bulk of veneer used,

FIG. 2 — Many panels of plied steel and wood are used in this Chicago soda fountain. The facing is 18-8 chrome - nickel steel which possesses beauty and non - staining characteristics

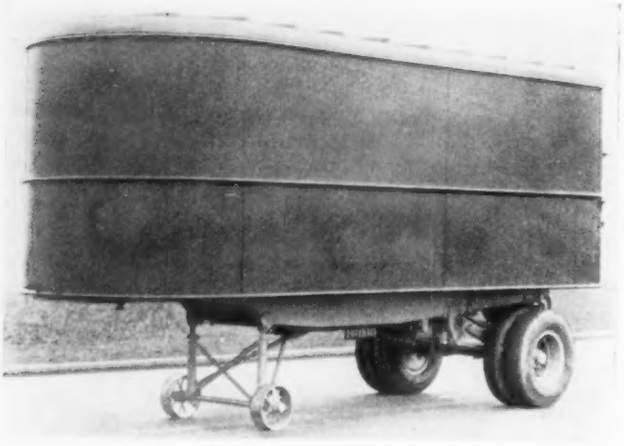


FIG. 3 — Panels of plied steel and wood are used in this van body and because they have great strength the supporting framework is made light

however, is one-piece stock and does not require taping. The assembled plies or veneers then are given a coating of glue.

Glue for the plywood is prepared from the dried animal blood, received in the form of soluble flakes, in a mixer and is spread by two long power-driven rollers constantly rotating in the glue. Veneers are passed through these rollers and an even spread applied. The gluing press consists of multiple cast-iron plates with flat faces, heated to about 210 degrees Fahr. by means of steam circulating through the interior of each plate. Under heat and pressure, the glue undergoes a coagulation and chemical change, and becomes insoluble. If the panels are to be molded, they are softened by boiling, placed in large presses containing special dies, and dried to the required form. If the molding is simple, the panels are bent around special forms, steam heated and held in place by a system of levers.

Clamped in Press

The application of the steel to the plywood is a process in itself, but the glue is spread much as before. The assembled panel units then are clamped in a hydraulically-operated press with cold instead of hot pressure plates. This press is capable of finishing panels up to 25 feet long and the adhesive produces an almost unbreakable bond between the plywood panel and the steel face. The steel is glued directly to the wood without any intervening materials to aid the glue bond. Panels are removed from the press in lifts by a monorail system.

Tests show that, due to the strength of the glue bond, efforts to separate the metal from the wood result in removing the zinc from the sheets, or the wood fibers adhere to the metal face. While plywood usually is employed as a core, wood fiber insulation boards take the place of the plywood when a certain type of insulation is required. Panels are stocked in many sizes up to 48 inches in width, ranging in length from 60 to 144 inches. The product is custom made, however, and has been produced in many special sizes.

Arrange High Temperature Research Program

Announcement is made by the joint committee of the American Society of Mechanical Engineers and American Society for Testing Materials on effect of temperature on the properties of metals that plans have been perfected for sponsored researches during 1932 at the Engineering Experiment station of University of Illinois, Urbana, Ill., and Battelle Memorial institute, Columbus, O.

Contributions and pledges so far made cover only about half of the $20,000 needed for the proposed three-year research program, but funds already made available by various interested groups have made it possible to initiate activities and to continue research work throughout the present year.

Work at the University of Illinois, under Prof. H. F. Moore, will relate largely to the endurance properties of austenitic nickel-chromium steels at different temperatures. This will be co-ordinated with creep tests at Battelle institute, under Dr. H. W. Gillett, as well as with studies at various industrial laboratories relating to the structural stability of those steels and the changes in various properties with time at high temperatures. Consideration will be given to wrought and cast metals from the same melts and in the case of the 18-8 chromium-nickel steel, to effects of carbon content and preliminary heat treatments on its chemical, mechanical and structural stability.

The researches relating to cast and wrought carbon steels already under way will be continued at the different co-operating laboratories and will supplement the sponsored researches now being initiated.

New Groups Join in National Metal Congress

Machine shop practice division of the American Society of Mechanical Engineers has voted to transfer the meeting originally planned in conjunction with the machine tool show in Cleveland to the National Metal Congress in Buffalo the week of Oct. 3. Postponement of the machine tool exhibition also has changed the plans of the Society of Automotive Engineers, which group now is planning to join in the Metal Congress, an annual affair sponsored by the American Society for Steel Treating, Cleveland.

Furthermore, definite arrangements have been made by the American Drop Forging institute to hold meetings at Buffalo during the Congress, marking the first time the institute has so participated. The meeting of the drop forging institute will bring together executives, technical and engineering men in the forging industry and several interesting sessions are being arranged for them.

Western Wire Products Co., St. Louis, manufacturer of wire products, is enlarging its manufacturing space and adding equipment to increase output 50 per cent.

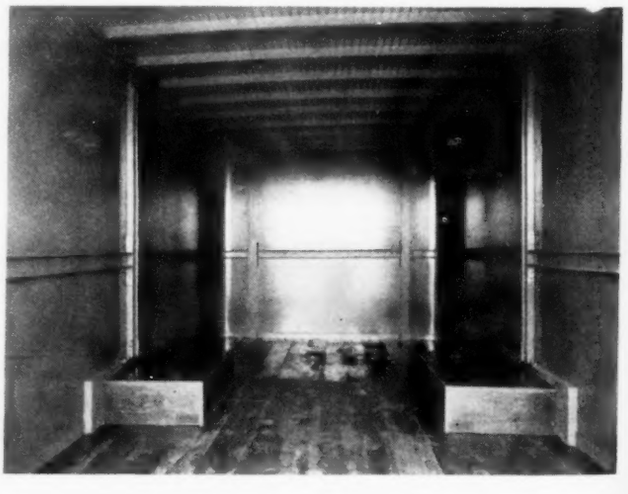


FIG. 4—A truck trailer which has a body of plied steel and wood. The rounded front end is made possible by molding the panels to shape after the steel is glued to the wood

Hydrogen in Rimming Steel Has Adverse Effect

BY HENRY D. HIBBARD
Consulting Metallurgical Engineer, Plainfield, N. J.

SKINHOLES are the bane of rimming steel and the great problem before makers of such steel is to find ways and means to prevent this occurrence. Located too near the surface of the ingot, when the skin of metal over them is consequently too thin, skinholes cause serious and even ruinous defects. The gas in these holes has been found to be chiefly hydrogen with small percentages of CO, CO_2 N_2 and CH_4 (methane), which indicates that hydrogen is the principal if not the only gas which makes them.

Hydrogen is not known to serve any useful purpose or to confer any benefit on rimming or other steel which contains it, but to work only harm. To avoid this trouble measures are demanded first, to minimize the amount of hydrogen entering the metal; second, to eliminate as completely as practicable, hydrogen held by the metal both in the melting furnace and in the mold; and third, to neutralize, as by holding in solution or otherwise, the effect of hydrogen remaining at the end in the finished steel.

Hydrogen in Various Forms

Hydrogen exists in iron and steel in at least three different states:

(1) That absorbed by electrolytic iron, meaning that metal deposited from solution by an electric current. This hydrogen may escape to some extent at room temperatures and does so copiously, so that it may be burned in a flame, when the iron is heated moderately or to a black heat, about 300 degrees Cent. Such hydrogen, as shown by its easy expulsion, is manifestly not chemically combined with the iron or even in solution.

(2) That taken up or occluded in steel when the metal is pickled in acid, as for cleaning its surface of scale. This hydrogen tends to make the steel brittle when cold, but it may be expelled and the brittleness overcome by heating to 600 or 700 degrees Cent.

(3) That taken up by melted iron which acts as if in solution and is certainly in a different state from (1) and (2) because heat will not expel it from the molten iron, but on the contrary will give the iron power to hold it. The hotter the iron—within limits perhaps—the more strongly it holds its hydrogen. Cooling tends to set it free, or at least weakens the grip of the metal on it, but this may occur too late in the history of the charge for its harm to be avoided. This point is extremely important in making rimming steel for injurious skinholes result from casting the metal too hot.

The sources of hydrogen in the bath metal are: (1) That in the charge materials; and (2) that absorbed from decomposed aqueous vapor in the air and fuel and formed by combustion of the fuel.

Because of its solvent power for hydrogen, manganese in the crude iron of the rimming steel charge should not be too high. Otherwise, it may introduce an excessive amount of that gas to the bath metal, which may then at the end retain too much of it because of high residual manganese. The proper percentage in the crude may lie between 1.25 per cent for small ingots cast in groups and 0.50 per cent for large ingots cast singly.

RIMMING steel produced by the million tons in American open-hearth shops for plates, shapes, pipe, sheets, wire, nails and other commodities, often is harmed by hydrogen. How this gas finds its way into the bath, is absorbed and expelled and what effect it exerts on rimmed ingots are described in the accompanying article which was presented at the meeting of the Open-Hearth committee, American Institute of Mining and Metallurgical Engineers, Pittsburgh, May 24-25. The author, Henry D. Hibbard, was one of the first men in this country to make rimming steel.

Silicon in the crude iron may also hold gases in solution and introduce them to the bath metal, but such gases will not be retained at the end by the silicon as that element must all be eliminated by oxidation before a proper decarburizing boil of the bath can be obtained.

Crude iron evolves gas on freezing so direct molten iron introduces some gas to the bath metal, when used in the charge, which cold pig does not. Research on this point also is needed to ascertain what this gas is and how to deal with it.

Hydrogen has been found in and extracted from cold as well as from heated and fused steels by several experimenters, though in widely varying amounts due perhaps to differences in the methods of examination employed, but also undoubtedly to differences in the steels examined and the various methods or processes by which they were made. Silicon steel may, of course, contain much hydrogen in solution but unless such steel forms a part of the charge it is unlikely that the steel scrap used will contain enough hydrogen to be troublesome. Still, the possibility must not be ignored.

Absorption, the other source of hydrogen, evidently must take place when the bare melting stock is exposed to the furnace gases, for it does not seem likely that hydrogen could be absorbed by molten slag or could penetrate it to reach the metal beneath. Hydrogen from decomposed water vapor is nascent, the oxygen combining with iron to form its oxide while the liberated hydrogen is taken into solution rapidly by the metal. Rapid melting, or melting the scrap submerged in the bath, probably tends to minimize the amount of hydrogen absorbed. In its bearing on the amount of hydrogen acquired by melting steel it may be important whether air blast or steam be employed to blow producer fires or to atomize liquid fuel in the furnace, as steam contains much more hydrogen than even damp air does.

Weather Is Factor

The weather, wet or dry, by determining the amount of humidity in the atmosphere, may seriously affect the soundness of rimming steel ingots. At a plant in Ohio which made both bessemer and open-hearth steel trouble occurred from thin-skinned ingots of soft steel made by both processes at the same time, which pointed strongly to excessive aborption of hydrogen from moisture in the atmosphere as a contributing and perhaps the chief cause.

Expulsion of hydrogen from the metal, if any is effected, must of course take place when the metal is melted, during the working and finishing periods. The only agencies making for or bearing on this point seem to be the boil of the bath in its variations both as to quantity and intensity, the successive temperatures of the bath, and the successive concentrations of manganese in the metal.

Boil, so-called, is the escape of bubbles of gas, mainly carbon monoxide, from the bath metal. It seems probable that, during the boil, other gases which may not be able to leave the metal unaided, and particularly hydrogen, are carried off by or with the escaping gas. Assuming this to be the case, the quantity of boil, by which is meant its vigor multiplied by its duration throughout the working period, should be

adequate for the purposes. This calls for a proportionate amount of carbon in the bath metal, when first wholly melted, and corresponding additions of ore. The more crude iron in the charge the more carbon and hence the more boil,, but also perhaps the more hydrogen and, possibly, other gases added in the crude iron which call for elision.

Wet weather, because of the increased amount of hydrogen then absorbed which must be elided, may call for more carbon and so for more crude iron in the charge, than dry weather. The use of steam blast to blow the fuel, by introducing more water, likewise may obligate more crude iron in the charge than when the fuel is airblown. Intensity of boil possibly may be a factor also, as it is conceivable that a gentle boil may not have power to carry off hydrogen under some given set of conditions while a stronger boil might do so.

Temperature of the steel bath, to favor the release of hydrogen, should manifestly be kept as low as possible, with the metal maintained sufficiently fluid. A higher temperature favors the retention of hydrogen by the greater power it gives the metal to hold that gas in solution, and also by the effect it has to lessen the intensity of the boil. The bath temperature should rise gradually after melting down, as the fusion temperature of the metal rises to the proper degree at tapping, due to its loss of carbon.

Whether a heat of soft steel which has become too hot in the melting furnace is wholly cured of its resulting ills, and particularly of its harmful excesses of gases, by cooling it to the proper temperature is a question. To answer it one must first know what harm a too high temperature, either previous to or at casting, does to steel, a matter which we do not know much about. If it is so cured its hydrogen and other gases must be expelled thereafter at a faster rate than usual. That may call for the addition of more crude iron to supply more carbon, which would require more ore to be added, resulting in more boil.

Effect of Manganese

Manganese has some slight solvent power for carbon monoxide as well as for hydrogen and nitrogen. In the bath metal therefore it may work the retention of hydrogen, both by quieting the boil and by its solvent power for that gas. For either or both of these reasons it should not be contained in more than a certain allowable proportion, at the end at least, of a rimming steel heat. There should be enough to minimize oxidation, but not enough to interfere seriously with escape of hydrogen.

The harm manganese does, if any, by increasing the content of hydrogen in the metal, it tends to correct by also holding more CO in solution which, escaping later in the mold, makes more vigorous effervescence

The final residual manganese, meaning the content just before tapping or before the final additions are made in the furnace, should not be over 0.10 per cent for casting in single ingots, usually top cast, or 0.15 per cent for group castings, usually bottom cast.

Silicon in the bath metal does not act like manganese in retaining the gases even though its solvent power over them is far greater, because carbon cannot be oxidized and so cause boil, until any silicon which may be present in the metal is practically all oxidized and so eliminated and its solvent power destroyed.

Residual Hydrogen

With all the means referred to for minimizing the hydrogen contained in the metal of the rimming steel bath used effectively, some of that gas still will be present in the metal at the end. The less of it the better, of course, as its saturation point is accordingly so much longer deferred as the metal cools. With good practice there may not be enough to cause serious harm, and in exceptionally good cases its effects are negligible.

As already noted the power of molten steel to hold hydrogen in solution diminishes as it cools so that its saturation point is approached and in trimming steel, with rare exceptions, perhaps passed. The saturation point is deferred because the escaping bubbles of carbon monoxide presumably carry off some hydrogen, but in ordinary good rimming steel this concentration of the gas should not be reached until a primary skin of clean solid steel at least 1 inch thick has formed. The saturation point may not be deferred in such steel by the addition of gas solvents such as silicon and aluminum, for an amount which would have that effect would check the evolution of carbon monoxide also, so as to give rising steel, the usual result of skinholes forming too freely.

Generally speaking, the less residual hydrogen in the bath metal at the end, the thicker will be the primary skin, but the casting temperature and manganese content also have important bearing on this point.

As its saturation point is passed hydrogen begins to separate from the metal and form bubbles which tend to attach themselves to the inner side of the solidified shell of the ingot, on both bottom and sides. With normal churning of the metal, caused by the escape of the effervescing gases, most of these hydrogen bubbles are dislodged from the upper part of the ingot, where the motion is most vigorous, and so escape, but they usually persist in large numbers in the lowest third or quarter where the motion is more gentle, and also across the bottom where there is practically no motion.

Rarely, all the bubbles on the sides are swept away, and only a few of those scattered over the bottom remain. Examples of such exceptionally fine ingots which had no skin holes on the sides, and one which had none on the bottom either, have come to the writer's notice. The makers did not know why these ingots had no skinholes nor could they knowingly duplicate them. The regular production of such ingots is the goal to strive for by makers of rimming steel. It may be that low residual manganese in the bath metal at the end, say 0.05 per cent or even less, would result in less residual hydrogen and so favor the production of such ingots.

In making killed or partly killed steel, aluminum is the most effective of the solvents to prevent escape of skinhole or other gas in the ingot. Silicon and titanium have similar though much weaker power. In such steels a moderate excess of either of the three works no appreciable harm. In rimming steel, however, neither of these solvents may be present in more than minute allowable amount lest the evolution of gas in the mold be unduly checked as noted. Manganese has also in a mild degree some solubility for the gases, for which reason the finished steel in the mold should not contain more than 0.4 per cent of it. If, with over 0.3 per cent, the steel shows any redshort tendency in the rolls, the melting furnace practice has been in some way faulty.

Excess Is Harmful

In several plants making rimming steel where the ingots were rather thin-skinned though not often ruinously so, high residual manganese, which ran up to 0.2 per cent and over seemed to be the cause of the trouble, by its solvent power over hydrogen. That amount was far more than was needed to prevent undue oxidation of the metal. The pig iron used at each of these plants contained around 2 per cent manganese, which was too high, as too much of it remained in the metal with the usual result. At one of these plants lowering the manganese in the mixer metal to about 1.25 per cent gave the bath metal about 0.10 per cent residual manganese and ingots with fairly thick primary skins.

It is better for the evolution of gas in the mold to be a little copious rather than to gentle since, is to plentiful, it may be checked readily by the addition of a little aluminum. If too mild the only practicable way to help matters is to teem slowly which may be objectionable because of the resultant spattering stream.

Exchange Ideas on Economy In Open-Hearth Practice

CURTAILMENT of steelworks operations to conform to consumer demand likely will hold the production of open-hearth ingots this year to about 16,000,000 tons, according to the prediction voiced by Chairman L. F. Reinartz in opening the fifteenth semiannual meeting of the Open-Hearth committee of the American Institute of Mining and Metallurgical Engineers, at the William Penn hotel, Pittsburgh, May 24 and 25. While some members of the committee questioned the advisability of continuing the open-hearth meetings in view of restricted company incomes, yet the consensus of opinion of over 135 in attendance was that no break in the activities should occur.

Costs Are Studied

Discussion of the procedure being followed in open-hearth practice to keep costs of production in line with low operating schedules, brought out the fact that manpower per furnace in many instances has been reduced while other companies have resorted to the stagger system to afford work to their organization although on a partial basis. At one plant the operator of the stripper crane also tends the stock yard crane and the charging machine operator runs the charging floor crane. Mechanical and electrical departments have been brought under the jurisdiction of the open-hearth department at many plants. With the various systems adopted under present conditions, greater efficiency is experienced although closer supervision is involved.

Various results were mentioned in connection with the coating of molds with tar. One operator reported trouble with cracked corners on ingots, attributing this difficulty to the dipping of molds in tar. Another speaker mentioned that at his plant where standard molds, 25½ x 25½-inches, are dipped in tar, no corner cracking of ingots is experienced on killed steel ingots weighing 11,300 pounds. His practice, however, is to wash the mold in a tank of water before dipping in the tar which precludes contamination of dirt with the coating. One operator cited the disadvantage of using tar high in benzol, as mentioned in STEEL, April 4, under "Progress in Steelmaking." At one plant in this country where the graphite is applied by spraying, only the fog and not the liquid, is allowed to strike the mold wall. Highly satisfactory results are accorded this practice.

One operator who has been assembling data for a period of three years covering the life of slab molds and the most common cause of their failure, hopes to present the results of his observation at the next meeting of the open-hearth committee.

At one shop where molds from 10x24 to 18x48 inches are used, the mold life averages 90 to 102 heats on all sizes and thereafter the life of the mold depreciates rapidly. Another operator reported a mold life of 85 heats before the development of bottom cracks necessitated the withdrawal of the molds from service. The life of molds at another plant is averaging 90 heats before cracking on the sides appears.

While one open-hearth superintendent prefers ingot molds containing 1.25 per cent manganese, a manufacturer of molds is of the opinion that the combination of silicon, carbon, manganese, and sulphur rather than the element manganese determines the mixture for molds.

In making open steel at one plant, the superintendent mentioned that when molds 14x51 inches were used trouble was encountered with snakes but when the shop went to 18x48-inch molds, which were thicker on the corner edges but thinner in the middle than the larger molds, the difficulty with snakes was eliminated.

Balanced Furnace Effective

In discussing the cutting action along the skewback one operator pointed out that in his practice air for combustion is forced into the furnace and a balance effected between the draft and incoming air. Before balancing, he asserted, the cutting at the skewback was pronounced but under the present arrangement this difficulty has been eliminated entirely. He mentioned that his furnace is on oil fuel. An operator in the Pittsburgh district was of the opinion that a furnace held under balance will cut less along the skewback than one not operated on balanced draft. According to another operator cutting at this point depends largely upon the type of fuel used.

The type of heat used to start up new or repaired furnaces after a prolonged shutdown differs at many plants. At one open-hearth shop regular heats are melted and the steel made into reinforcing bars. At another plant heats of 0.08 to 0.10 per cent carbon and semikilled are made and converted into nails. The practice of another shop is to have the furnace up to a good temperature with the bottom well heated and then melt a soft heat. Another superintendent aims to put in heavy charges of billet crops and high-grade scrap and to use silicon in the ladle and aluminum in mold.

Discussion of the effect of high ferrostatic head pressure in the ladle on the production of so-called butt seams brought out a variation in pouring practice. At one plant using ladles 14 feet deep the practice is to pour to a depth of 2 inches in the bottom of the mold before opening the ladle up. At this particular plant pouring boxes were tried but this practice was abandoned. Better surfaced ingots and the elimination of some inclusions are thought to have resulted at one plant where an auxiliary ladle is used in the pouring operation. At this particular plant an auxiliary ladle of 20,000 pounds capacity is suspended from the crane beneath the main ladle, 12-foot deep and with a capacity of 115 tons. Each ladle is equipped with the same size nozzle, namely 2¼ x1¾ inches, and both ladles are lined with the same kind of brick. The speaker pointed out that to avoid skulling, the small ladle had to be kept hot. Similar practice was tried on big ingots for plates at another plant but the results were not satisfactory according to the open-hearth superintendent.

Temperature Is Increased

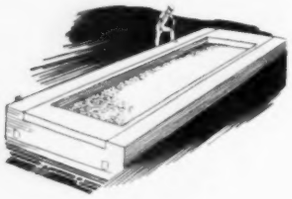
Experience with 2-pass checkers prompted the statement from one open-hearth operator that better production was secured and a 200-degree temperature increase noticed as a result of an installation of a second chamber. A 2-pass checker with 10½-inch openings was tried on a furnace at this plant using pitch or tar as fuel but without success. A motor driven fan had to be used for the combustion air and practically no fuel economy was shown. Results of a 50,000-ton campaign at another plant using 2-pass checkers showed an increase in production of a few tons per hour and a saving in time by reason of the fact that the furnace could be charged faster. The first passes were laid up with fire brick and all openings were 10½ inches. The installation of 3-pass checkers on an Isley type furnace gave an increase checker temperature of 250 degrees, according to the operator. Operating results showed less clogging in the first pass, compared with former practice, and no clogging in the second and third passes. Two hundred heats have been taken off since the installation was made and no brick have had to be replaced.

A wide variation in the life of frontwall at open-hearth shops in this country exists. On furnaces tapping 150 to 160-ton heats the frontwall life averages from 100 to 110 heats, according to expressions made by various operators. On furnaces tapping smaller tonnages the life of the frontwall averages from 60 to 80 heats. At one plant where chrome brick are used to lay up the front wall, 150 heats per run are being secured.

(To be concluded next week)

MAKING THE MOST OF STEEL

CONTRARY to the relative indifference shown concerning market price costs of fuel for furnaces in the last few years, fuel engineers now note a well-defined trend toward close scrutiny of basic fuel costs for drop forging, heat treating, galvanizing and for heavy furnace work. In the use of the heavier oils, it is pointed out that much study is necessary to adopt installations that provide for temperatures to lower the viscosity so that the fuel is comparable with the lighter oils at atmospheric temperatures. Some views are that this country's industrial fuel costs are approaching the line of lowest fuel costs now obtaining in various foreign countries.



A STRUCTURAL fabricator recent-installed an unusually efficient pot for galvanizing structural shapes to go into transmission towers or other structures exposed to the weather. A thermocouple in the bath connects with a control mechanism which magnifies temperature changes 100 times. That is, when the temperature in the bath drops 1 degree, the control dial registers a drop of 100 degrees. The purpose of this magnification is to accelerate the regulation of combustion in the combustion chamber. By this delicate control, this furnace is operating within limits of 5 degrees Fahr., while the load varies from no load to maximum capacity. Advantages take the form of greater uniformity in galvanizing, less dross from overheating of the zinc, and less deterioration of the pot which usually results from overheating.

$ $ $

Utensils fabricated from 18-8 chrome - nickel corrosion - resisting steel and subjected to deep drawing harden rapidy on cold work and should be heat-treated promptly after each draw. One plant manufacturing milk cans found that a large percentage of parts left over night were found cracked from internal stress by the next morning.

$ $ $

Localized annealing for jig, fixture and die work, when the article must be annealed in certain local spots or areas to resist shock or to permit further machine operations, can be carried out successfully with the aid of an electric resistance welding machine.

$ $ $

Applied by an air spray gun, rubber latex is being used for lining metal containers and for covering utensils, parts and fittings which require a protective coating. Containers for acids are treated with the soft rubber, which is stabilized with ammonia.

$ $ $

A forge plant which long had used wooden baskets for pickling forgings obtained a basket life of only a week because the forgings were heavy and were thrown into the containers. A year's supply cost $5300, but for an investment of $1600 the company purchased a number of acid-resisting metal baskets which lasted well over a year. The saving in this case was $3700, or approximately 70 per cent.

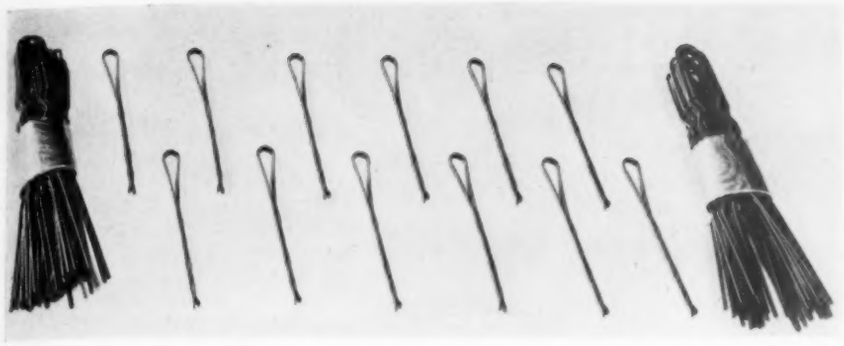
$ $ $

Considering the cost of electrical energy at 1 cent per kilowatt-hour, an authority on resistance welding estimates that 1 square inch of tubular steel may be flash welded in 5 seconds at a cost of 0.18 cents, and 2 square inches of area may be welded in 11 seconds at a cost of 0.40 cents.

$ $ $

In an effort to aid in the recovery of agriculture and industry in the southern states, a mid-western manufacturer of baling wire is using cotton wraps for the ends of bundles instead of the customary burlap. Likewise all tags will be made of cotton cloth. It is said that hundreds of bales of cotton will be required for this purpose each year.

A MANUFACTURER of porcelain enameled wall tile has developed a new method of installation which eliminates many of the difficulties formerly encountered. The tiles consist of pieces of steel about 4 inches square, shaped somewhat like the lid of a box with the edges rolled slightly. These are porcelain enameled on the face, back and edges. To mount these tiles, rows of metal clips are aligned on a three-ply warp-proof, water-proof board and these boards are nailed to the studding in new houses or directly to the wall in old houses. The tiles then are snapped over these clips and, because of the rounded edges, considerable force is necessary to dislodge them once they are in place. When the joints are cemented with a special water-proof cement, the wall is complete. On account of the heavy steel backing, this tile offers great resistance to chipping.



Bobby pins, made of flat, springy wire to clasp strands of bobbed hair, are shorter than the standard type of old-fashioned hairpins. Consumption of steel for bobby pins is estimated at 500 tons annually

Large Uses of Steel In Small Ways

218th Article ◆ Bobby Pins

FIVE hundred tons of steel wire is consumed annually in the United States in making bobby pins, according to manufacturers. One thousand pins weigh a pound; therefore, a billion represent an average season's output. As they sell at a low price—20 on a card retailing at 5 cents—and as they are indispensable aids to women with bobbed hair, the demand is fairly steady.

The bobby pin was developed in 1926 to meet dictates of a new fashion. It differs from the old type of hairpin in that it is shorter, lighter, less conspicuous, and grips a strand of hair between its spring-like ends.

See Declining Market

Some manufacturers believe the market for bobby pins has reached its peak, that indications point to a change from the mode of hairdressing which has made the pins popular. One states the output of old-fashioned hairpins is considerably heavier, but the industry lacks reliable statistics.

Since the hairpin industry was first established in this country in 1871 by William Smith, the founder of what is now Smith & Sons Corporation, Buffalo, it has grown until there are 22 manufacturers. It is conservatively estimated that the annual production of the industry has a valuation of at least $3 000,000.

A flat wire, 0.018 to 0.02-inch thick, and 0.062 to 0.075-inch wide, is used in making bobby pins. This wire is either open-hearth or bessemer steel, usually with 0.7 per cent carbon, though some manufacturers require 0.95 per cent carbon. Round wire used for the ordinary hairpin is 0.02 to 0.05-inch in diameter, though most of it is under 0.03-inch. Practically all the round wire is of low carbon steel, and sold in 30-pound reels.

Heat treating is an important process in the manufacture of hairpins, especially bobby pins, each plant guarding its particular process carefully. For instance, one producer uses coal, gas and electric heat for its various heating processes, this being necessary, it is believed, to relieve the various strains to which the wire is subjected in shaping it into hairpins.

A hairpin, either of the bobby pin or old-fashioned type, is formed in one operation on one machine. With modern type of equipment, it is easily possible to produce as many as 10,000 per hour per machine. The pins are finished in black, brown, straw color and steel gray. The largest tonnage is in black. Brown, it is said, probably constitutes one-twelfth of the total, while the remaining shades, combined, do not represent more than 1 per cent. Coloring is applied after the hair pin is made; the last thing, in fact, before the product is packed.

This country has long been an exporter of hair pins. American manufacturers are protected by a 35 per cent tariff.

Training Course To Guide In Proper Lubrication

As a result of many requests for information on lubricants and bearing testing machines and special information regarding lubrication of advanced types of all classes of machinery, the lubrication engineering committee of the petroleum division of the American Society of Mechanical Engineers is preparing a complete course of instruction for the training of lubrication engineers.

This course will deal with the fundamentals of lubrication and with the application of the lubricants to all classes of machinery. It will also explain the testing of such machinery to determine if the most effective lubricants have been applied and indicate how a correction of the application systems can be applied to bring about the highest degree of economy.

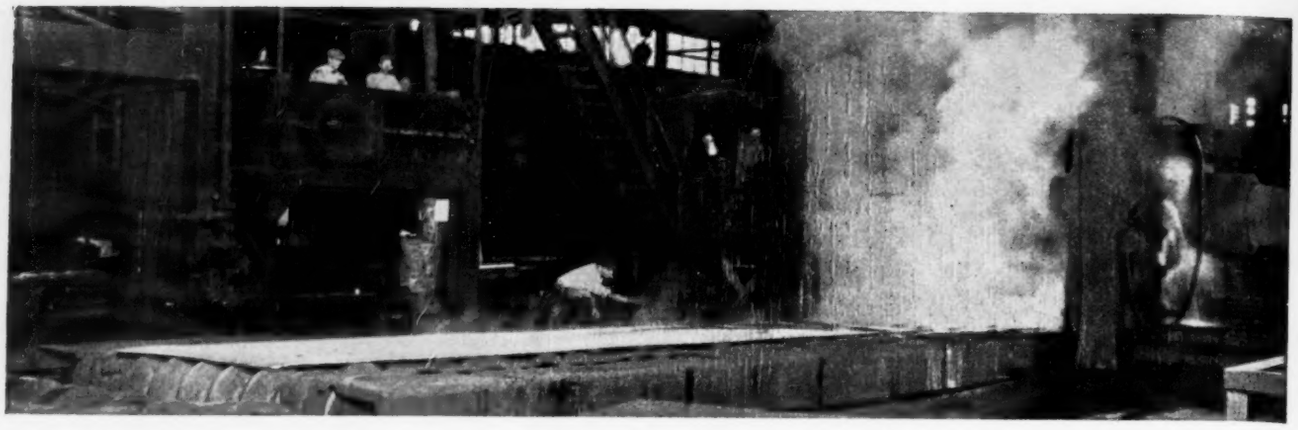
The report is being written and revised by leading experts in the petroleum and allied industries. It now is in its last stages of preliminary writing and after its acceptance by the various trade associations will be made available through the society.

Cadmium Is Plated By New Process

A NEW process for electroplating steel and iron with cadmium for protection against corrosion has been developed by the Hanson-Van Winkle-Munning Co., Matawan, N. J. It is called the Cadux process and the claims made for it are a dense grained, nonporous deposit which will give the maximum protection against corrosion; a clear bright, silver-white finish which adds to appearance and salability of the plated article; and a solution which, if controlled by the analytical methods developed by the manufacturer, is simple in operation and produces consistently the same class of work.

Generally cadmium deposits are dull and easily stained, but it is said that articles plated by the new process and Nitri-Brite dipped can be assembled without being stained by handling of the parts. This is a distinctive feature of the process. The dip is a process controlled exclusively by the company and is claimed to be the only process by which an electroplated cadmium coating can be bright dipped.

In general, brightness is dependent upon addition agents which are in such minute quantities that it is difficult to control their action. In conjunction with this dipping process, however, the effective range of an addition agent is increased greatly as the bright dipping will remove the slight film on the plated surface. This makes it possible to operate a section without the necessity of such close control as is required when luster of finish is dependent upon some addition agent.

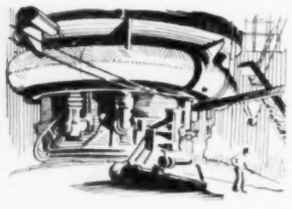


PROGRESS IN STEELMAKING

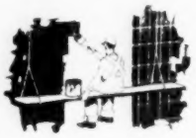
LEAK-PROOF joints in brick-lined pickling tanks is afforded by a newly developed sulphur-base compound which is impervious to hot and cold sulphuric or hydrochloric acid solutions. The bonding material in 10-pound slabs is melted above 235 degrees Fahr. and then poured between the acid-proof bricks. Deterioration of the tank and joints is precluded as long as the temperature of the solution does not exceed 220 degrees Fahr.

• • •

Measuring strains in beams and rails has been made possible by the development of a magnetic gage about 8 inches long. The center section has two coils which carry an electric current. A movable armature adjustable between the pole pieces alters the air gap across which the flux passes from the two pole pieces to the ends of the armature. Any change in the length of the air gaps unbalances the voltage across the gage coils and indicates the degree of strain in the beam or rail at the point to which the gage is attached.



ACID bottoms now are being used in many of the large European blast furnaces with satisfactory results on all grades of iron. The practice in building the lining is to overlay the silica brick bottom with aluminous brick to a depth of 12 to 20 inches to facilitate slow uniform heating during the blow-in and to obviate the rapid expansion and disintegration of the silica brick. Operating results show the aluminous brick layer soon disappears but that the formation of the salamander is arrested when the silica brick is reached.



PROTECTIVE paint for use on blast furnace and stove shells, heating furnace and boiler fronts, stacks, breeching and other steel surfaces exposed to extreme and rapid changes of temperature and atmospheric conditions now is available. The protective coating is claimed to be sufficiently elastic to expand and contract without cracking or peeling and practically is immune to the action of moisture in the atmosphere and dilute acid.

• • •

Rustless scrap now is being melted without changing its chemical composition in electric furnaces of the coreless induction type. The melting chamber is lined with a basic refractory composed of 60 per cent magnesia and 40 per cent alumina which is resistant to slag and neither expands nor contracts to any great extent through the range of room to pouring temperatures. In one installation 76 4-ton heats of stainless steel valued at $112,000 were poured from one lining.

• • •

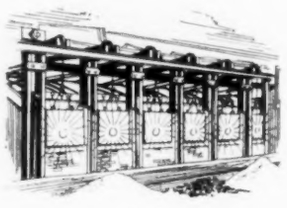
Diffusion combustion for sheet and pair furnace heating is gaining favor in the sheetmaking industry because of the advantage offered in controlling decarburization. The increase in the radiation of the flame affords an improvement in the method for heat transfer and the injection of free carbon into the furnace atmosphere prevents the sheets sticking together. The new development gives promise of eliminating the charcoal dip now used by high-grade sheetmakers to prevent sticking packs during the heating and rolling operations.

• • •

Physical properties of steel are affected by nitrogen in the same manner as phosphorus, according to recent observations of a metallurgist in the Chicago district. However, tests disclose that its effect is four times that of the same quantity of phosphorus.

• • •

Development of a new alloy composed of vanadium, chromium, tungsten, cobalt and nickel and suitable for piercing points and plugs used in the making of seamless tubing, has reduced tooling costs 75 per cent, decreased the percentage of mill rejects and enabled manufacturers of seamless tubing to compete with welded pipe and corrosion-resisting tubing on a more equal basis.



IDEAL open-hearth bottom material, comments an open-hearth steelmaker, is commercially pure magnesium oxide and that the older the bottom becomes, the more the normal penetration of iron oxide in the bath lowers the fusion point. So that any calculated thermal conductivity should take into consideration a sufficient allowance for this particular condition.

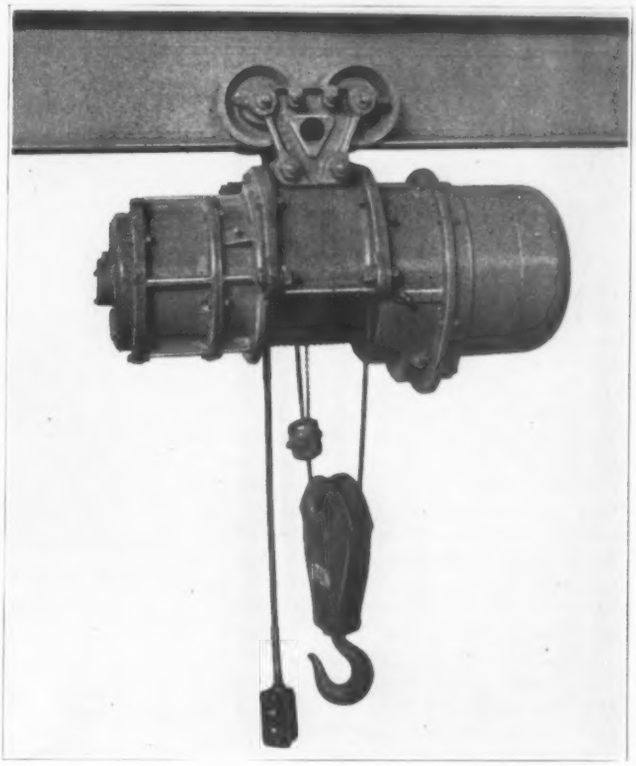
How a P&H Milwaukee Hoist Doubles Production For Only $65 Per Year

Modernize today that you may reap a larger return tomorrow! Thousands of companies are doing just this thing. Times are different—production processes are changing at a terrific rate. A man with a hand-operated hoist is no longer considered an efficient producer in American industry.

Such an operator can handle about 4000 pounds an hour—if he's a good man with a strong back. But give that man a P & H Milwaukee Hoist and he handles 9000 pounds, more than twice as much. And he can control his work better, is freer to watch production, is safer and more efficient.

Allowing for 100 lifts a day, 300 days a year, the cost of operating the hoist is about $65 including current, maintenance and depreciation. $65 isn't much to pay for doubling a man's annual production.

Yet this isn't an unusual case; it's typical of the way P & H Milwaukee Hoists can cut into costs, can speed up production, and shorten waste time.



Our engineers will be glad to study your material handling problems and make recommendations. Write today—or, just to start things, use the coupon to get Bulletin 202C.

P&H MILWAUKEE HOISTS

FOR ANY USE ANY PLACE

HARNISCHFEGER CORPORATION, 4411 W. National Ave., Milwaukee, Wis.

I want to know more about cutting handling costs. You may send me your Bulletin 202C.

Signed..... Company.....

Address..... City..... State.....

Scanning the Technology of Steel

A Digest of Important Developments in Scientific Research, Engineering Progress and Operating Procedure Pertaining to the Production, Processing, Application and Performance of Steel

Soaking Pits

Soaking pits without checkers, by J. B. Nealey, in Blast Furnace and Steel Plant, May 1932, *p.* 428, 2 *pp.*, 2 *illusts.*

A new type of soaking pit has been developed during the past few years by a leading industrial furnace builder and has been installed in numerous steel plants where it has shown excellent savings with regard to first cost of installation and operating results. These savings are derived principally from the simplicity of construction and the better control over temperature and atmospheric conditions within the heating chamber. Checkers have been discarded for refractory tile recuperators or metallic air preheaters and the intermittent reversal of firing and draft has been supplanted by the one-way system, in which the gases are fired continuously through a port at the top of the pit and taken out continuously through a waste gas flue at the bottom of the pit in the same wall with the firing port.

Gas is used as fuel, and hot air from the recuperator is supplied to the burners with gas in the correct proportion for complete combustion. The air preheater is of the continuous regenerative type and comprises a brick shell, steel encased, divided into three compartments. Within each compartment is suspended a pack of 1/16-inch steel sheets with a small air space between each sheet. The compartments are operated on cycles with the flow of gases and air through the individual chambers periodical; approximately 2½ minutes are required for the heater to pass through the complete cycle.

—STEEL, 5-30-32

Reclaiming Borings

The open-hearth furnace as a means of recovering cast iron from borings, by T. L. Joseph and C. E. Wood, a paper presented at the annual meeting of the American Foundrymen's association in Detroit, May 2-5, 7 *pp.*, 3 *illusts.*, 2 *tables.*

Because of the difference in current prices of pig iron and cast-iron borings the use of borings offers a substantial financial inducement to plants operating foundries and machine shops from which borings segregated as to composition can be obtained. Results of experiments are detailed which show that cast-iron borings can be melted in an open-hearth furnace, provided they are properly protected before and after melting with slag and small coke. The weight of the metal recovered will be about 90 per cent of the weight of the borings charged. Under proper supervision it seems feasible to cast the metal direct from the open-hearth furnace, inasmuch as the iron can be superheated if desired, and chemical specifications met. As an alternative, the metal from the open-hearth furnace can be pigged and melted in the cupola.

—STEEL, 5-30-32

Plastic Deformation

The plastic deformation of metals, twenty-second annual May lecture of the Institute of Metals, London, Eng.; delivered May 11 *by Prof. Dr. F. Korber, director, Kaiser Wilhelm Institute, Dusseldorf, Germany.*

Basing his remarks on the results of a series of investigations conducted at Dusseldorf during recent years, the speaker dealt with the stress relationships and also with the course of flow of material which arose during the most important mechanical shaping processes. Discussion of plastic flow was presented and also of the possibility of drawing conclusions from the resulting flow phenomena as to the distribution of stress in the material at the inception of deformation. Disturbances in the material in consequence of the more marked deformations in drawing, extrusion and rolling were traced by a suitable method of investigation, and results were compared with the deformation structures obtained by X-ray methods.

The knowledge of the deformation processes so obtained enabled conclusions to be drawn as to the energy or power used in shaping operations. An exact analysis of the course of deformation in the transition zone lead to reliable estimates of the internal losses during the alterations in form. Quantitative treatment of the stress relationships which occurred in the zone of deformation was possible insofar as the pressure created at the surfaces of contact between the tool and the material was known by actual measurements. From the results of determinations along the roll gap of the pressure between the rolls and stock being rolled a complete quantitative presentation of the distribution of stress in the transition zone between the rolls was formulated.

—STEEL, 5-30-32

Nickel Steel Castings

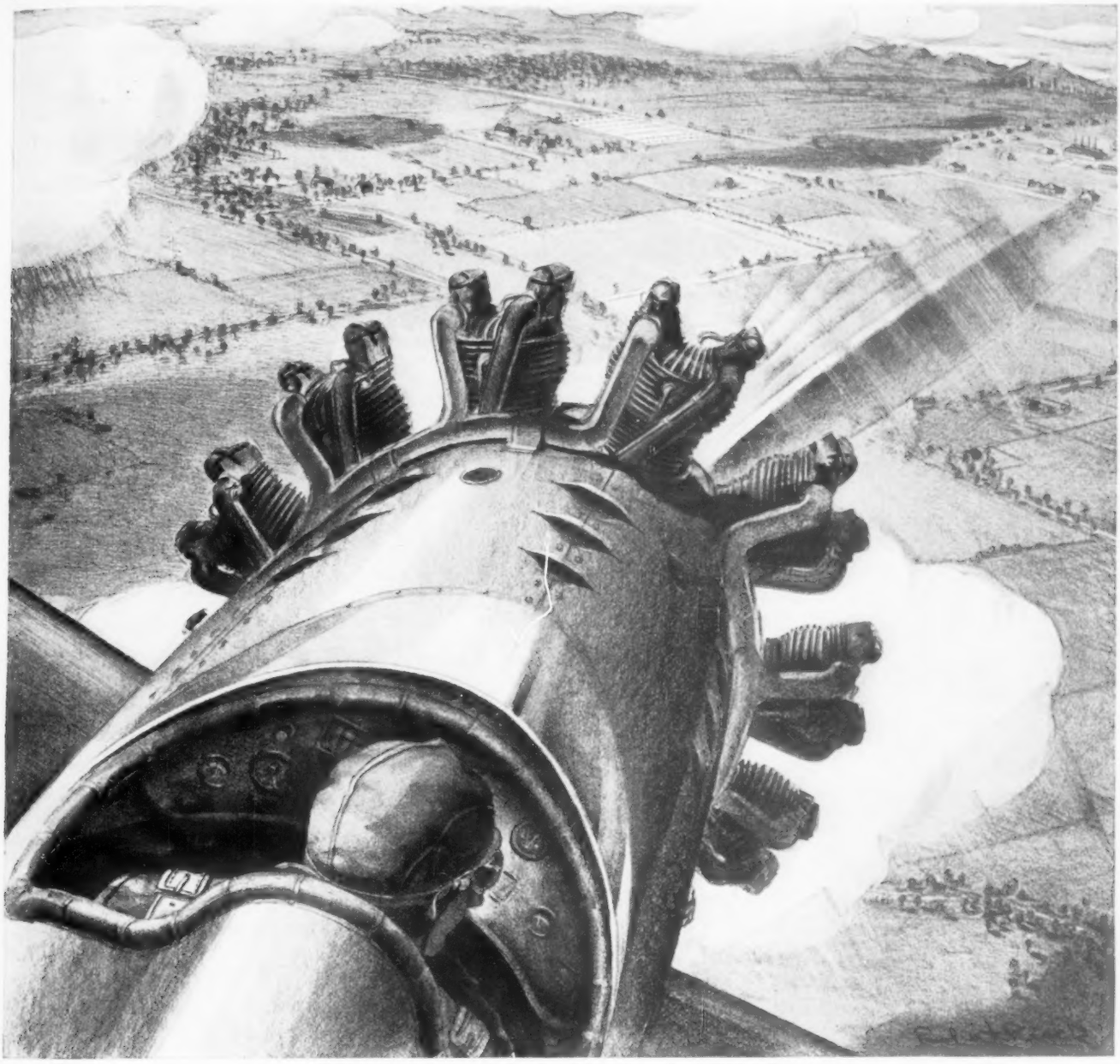
Nickel alloy steel castings, by A. G. Zima, bulletin No. 8-A of the International Nickel Co. Inc., from data originally appearing in The Steel Founder, 12 *pp.*, 11 *illusts.*

Aside from their excellent properties as shown by the ordinary static tensile tests, nickel steel castings possess remarkable dynamic properties, that is, resistance to impact and fatigue stresses. They are well adapted to most industrial applications and constitute an engineering material embodying additional factors of safety. The selection of the proper type of steel for castings is a factor which is often under-emphasized. Many failures have occurred which might have been avoided had the steel used been more suitably adapted to the requirement.

Data are presented on a number of typical nickel steels for castings requiring high strength and toughness, castings subject to high impact and fatigue stresses, and miscellaneous applications. Effects of certain alloying elements on cast steels are outlined, including nickel, chromium, manganese, molybdenum, vanadium; methods of adding these alloys to steel also are described. Annealing, homogenizing, normalizing, quenching and tempering treatments and their functions as applied to alloy steel castings are discussed.

The purchaser of alloy steel castings rightfully expects much more in the way of service and performance than if plain carbon steels were employed. He must not lose sight of the fact, however, that design assumes an important role in the production of sound, serviceable castings. Moreover, with proper design, the full advantages of alloy steels may be realized through economies in weight and the facilitation of efficient heat treatment.

—STEEL, 5-30-32



. . . hour after hour without a stop
It takes GOOD alloy to meet these tests

ILLINOIS *alloy* STEEL

ALWAYS DEPENDABLE

By every known care and every known test, Illinois Steel Company controls the uniformity of its alloy steel that the tests of time and use may be met without flaw or failure.

Illinois Steel Company
SUBSIDIARY OF UNITED STATES STEEL CORPORATION

208 South La Salle Street, Chicago, Illinois

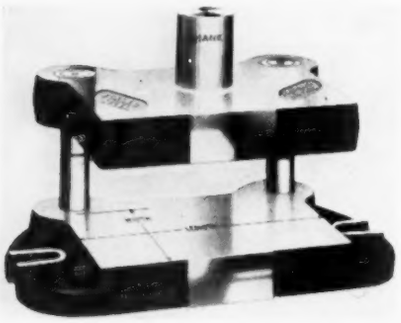
New Equipment

PRODUCTION FABRICATION TREATMENT FINISHING

Introduces Drop Forged Steel Die Sets

E. A. Baumbach Mfg. Co., 1812-1818 South Kilbourn avenue, Chicago, just has placed on the market drop forged steel die sets to meet exacting requirements of punch press work. All die shoes and punch holders are drop forged from 35-40 carbon steel, completely normalized, and all shanks are drop forged as an integral part of the punch holder.

Another feature in the design and construction of these die sets, shown in the accompanying illustration, is that of fitting the punch holders with bushings made of high content manganese steel, thoroughly carbonized, hardened, ground and lapped to an individual fit on each leader pin of the corresponding die shoe.



Baumbach drop forged steel die set has carbon steel shoes

◆

Cleaning Machine Generates A Vapor Spray

Homestead Valve Mfg. Co., Inc., Coraopolis, Pa., is manufacturing a high-pressure jenny which is the outgrowth of an idea to produce a cleaning machine combining, in correct proportions, heat, cleaning compound and pressure—the three elements necessary to remove dirt, grease, paint, etc., thoroughly and successfully. It is designed for cleaning machinery, floors, windows, monitors, automobiles, motors, exteriors of buildings, tanks, vats, steel barrels, etc.

The unit, shown in the accompanying illustration, supplies through a single nozzle, hot water vapor, pressure and cleaning compound, combined properly. Comprising the operating mechanism are five major elements, a gravity-feed kerosene pilot burner, a pressure-feed kerosene main burner, automatic water (or solution) and fuel pumps, a heating coil or generator, and an outlet or hose connection for transmitting the vapor spray.

When pressure reaches the maximum for which it is manually set, the pressure under the fluid pump plunger overcomes the actuating spring pressure and the two pumps and the main burner stop. If the pressure drops a few pounds the spring again picks up the load and the pumps and main burner function until maximum pressure is restored.

◆

Motors Capable of Rapid Reversals

Reliance Electric & Engineering Co., 1042-1090 Ivanhoe road, Cleveland, has developed a line of alternating-current motors for driving automatic roller and catcher tables in sheet and tin plate mills. These units are designed with torque characteristics to give rapid reversals, at the rate of 40 a minute. Low-inertia rotors are provided to keep reversing losses to a minimum.

The motors are fully enclosed for protection against dirt, oil and moisture. Liberal radiating surfaces keep the temperature rise within normal. Internal and external fans are made of cast duralumin. Internal and external cooling circulations are provided. As an added factor of safety, asbestos windings are provided.

The motors, one of which is shown in the accompanying illustration, may be built so that they are interchangeable for tabletilt and conveyor, and are furnished in all sizes required for the various kinds of mills used for rolling sheets and tin plate automatically.

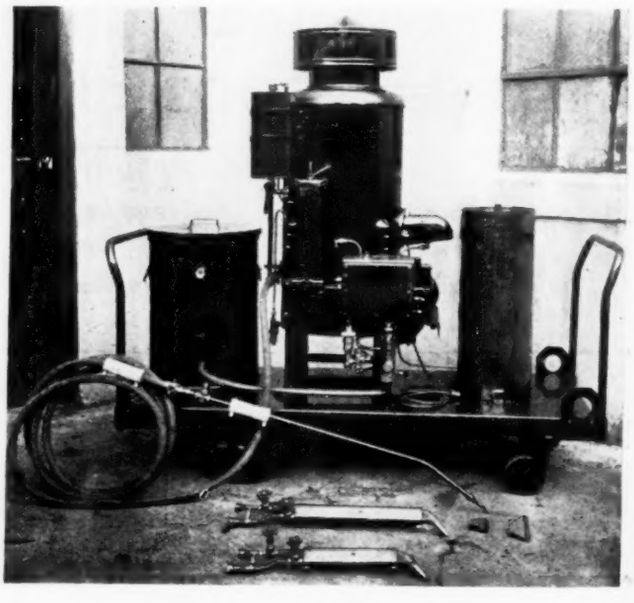
Reliance motor for automatic roller and catcher tables

◆

Dynamometer Measures Stalling Torque

Toledo Precision Devices Inc., Toledo, O., has introduced a dynamometer scale which registers the stall-

HIGH-PRESSURE jenny developed by Homestead Valve Mfg. Co. Inc., generates a vapor spray for economical cleaning, sterlizing, disinfecting or deodorizing. Full pressure ranging up to 150 pounds can be developed in from 6 to 10 minutes. Simplicity and ease of operation feature this industrial cleaning machine



ing torque of starting motors. The device is easy to operate and is designed, as shown in the accompanying illustration, for mounting on a bench. A cradle for the motor to be tested is placed adjacent to it.

Test procedure is as follows: The shaft of the motor is placed in alignment with the horizontal arm extending from the dynamometer. After the motor is clamped into position by an eccentric, a sliding coupling on the horizontal arm is pushed over the shaft of the motor. The clamping device engages with a keyseat in the end of the motor shaft. Current then is applied to start the motor revolving. It is, however, prevented from rotating by the arm of the dynamometer,

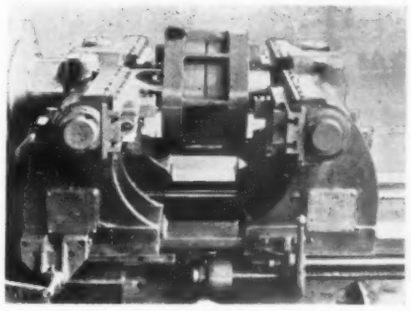
Toledo torque dynamometer designed for bench mounting

with the result that downward pressure on the arm registers on the dial and the operator reads the stalling torque.

◆

Designs Unit for Machining Of Rabbet Fit

Gisholt Machine Co., Madison, Wis., recently designed a special machine which will perform a rabbet fit operation on both ends of several sizes of electric motor frames in 3 to 4-2/3 minutes each, floor to floor. This machine, shown herewith, is designed to meet the requirements of those manufacturers who prefer to bore the assembled frame and punchings first



Gisholt unit machines rabbet fits on motor frames

and then machine the rabbet fit while locating the frame from this finished bore in the punchings. It has a 44-inch swing and carries one adjustable fixed carriage and one transversing carriage on flat ways. These carriages each carry three tool slides and contain the necessary cams and mechanisms for actuating the slides.

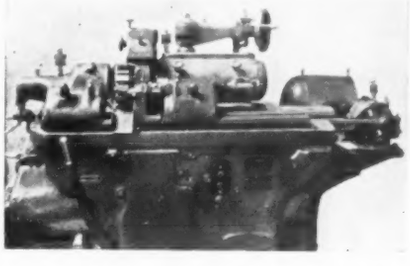
An air-operated expanding mandrel attached to the spindle and supported in both carriages is provded to hold the motor frame which is located horizontally by a locator stop mounted on top of the fixed carriage. Finishing tools in the rear slides remain stationary during the first 17 revolutions of the work and then start feeding in, reaching the work at the instant the roughing tools retract. The sizing tools are timed to start cutting just as the finishing tools retract.

◆

Polishing Unit Facilitates High Production

Landis Tool Co., Waynesboro, Pa., has placed on the market an automatic polishing machine to meet the requirements of high production. Reciprocation of the wheel carriage, indexing of the work turret and movement of the footstock, all take place automatically at the correct time in the polishing cycle.

Friction drives the work. After each piece is polished it drops from



Landis polishing machine is fully automatic

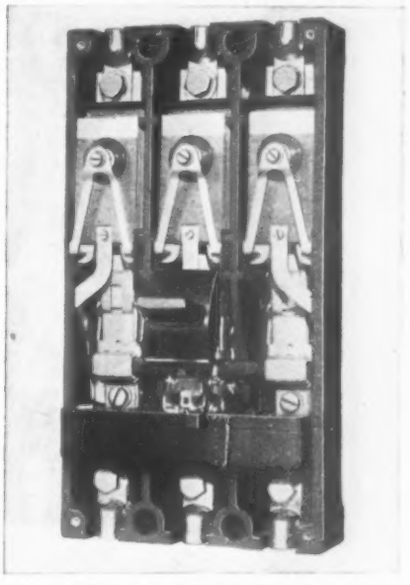
the turret to a chute which delivers it at the front of the machine, shown herewith. A felt wheel is employed—the face being loaded with the polishing meduim. Dust is carried away by an exhaust system.

A small Landis grinder has been utilized as the base. Net weight of the unit is 4300 pounds and floor space required is 7-2/3 x 4 feet.

◆

Device Provides Circuit Protection

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has announced a safe, flashless device to perform the function heretofore left to carbon circuit breakers or fuses. The new circuit breaker, shown in the accompanying illustration, cannot be held against an abnormal overload or short



Westinghouse circuit breaker with cover removed

circuit nor can it be blocked to prevent opening the circuit.

The trip mechanism consists of a bimetal thermal unit calibrated to trip at 125 per cent overload. On breakers of 50 amperes or more an additional trip of the magnetic type actuates the breaker instantly on short circuits. Upon being released by the trip mechanism, the cradle beam moves, permitting the toggle linkage to break and the contacts to open at high speed.

The 15 to 50-ampere units are available in 1, 2 and 3-pole combinations, 125 and 250 volts. The 55 to 600-ampere breakers are furnished in 2 and 3-pole combinations up to 575 volts.

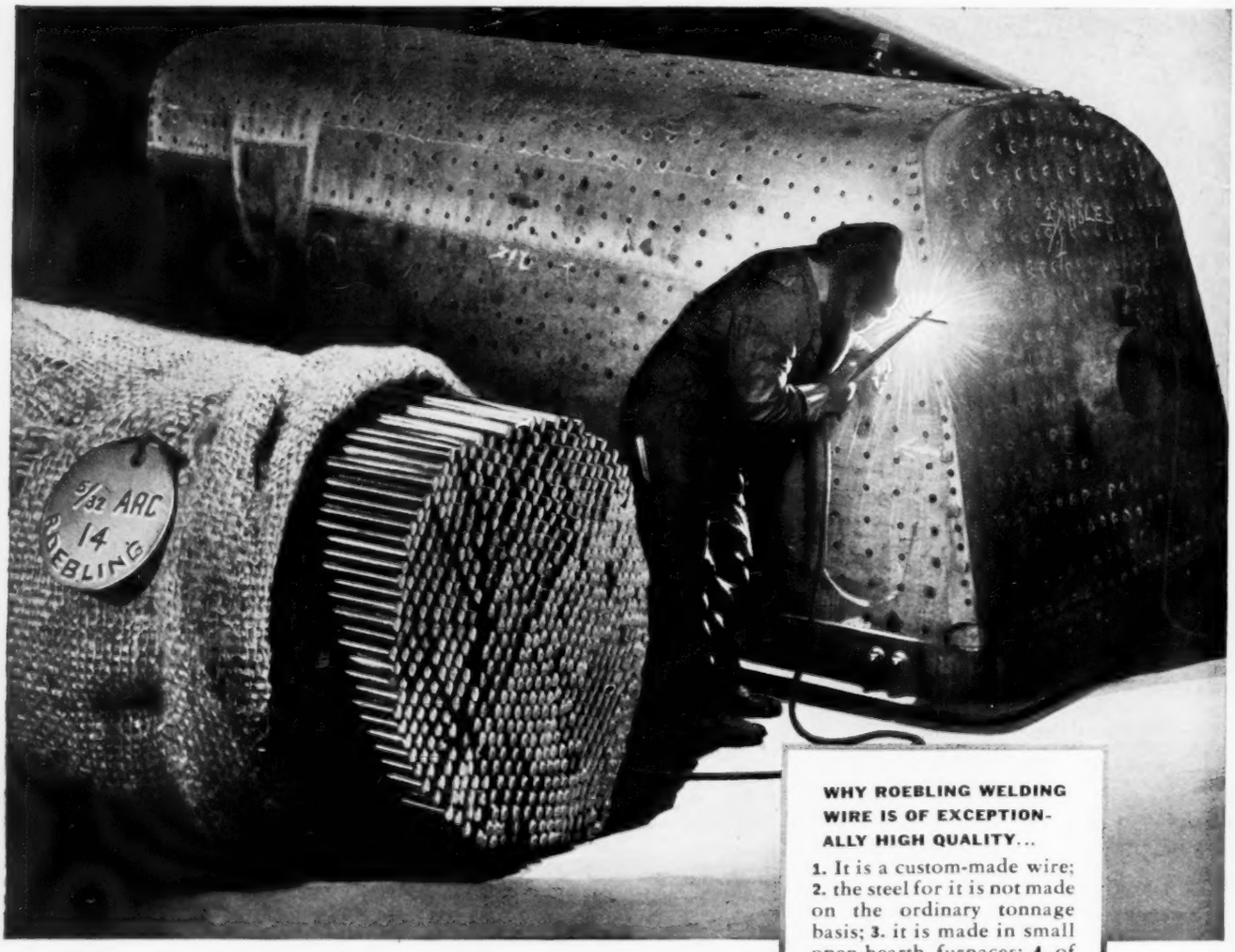
TO MEET
exacting WELD REQUIREMENTS

In railway shop work as illustrated, in shipbuilding and building construction, and for a wide variety of fabricating and maintenance jobs —where welds must be of utmost dependability —Roebling Welding Wire is widely used.

The method of making this fine wire is special throughout—from the open-hearth process clear through to the final operation. As a result, it is absolutely uniform in quality and free of non-metallic impurities—and greatly aids in the production of tough, strong welds.

Why not write for samples of Roebling Welding Wire and test its qualities? It is made for both gas and electric welding, in a variety of analyses. Our nearest office is at your service.

JOHN A. ROEBLING'S SONS CO. - TRENTON, N. J.
Atlanta Boston Chicago Cleveland Los Angeles New York Philadelphia Portland, Ore. San Francisco Seattle Export Dept, New York, N. Y.



WHY ROEBLING WELDING WIRE IS OF EXCEPTIONALLY HIGH QUALITY...

1. It is a custom-made wire; **2.** the steel for it is not made on the ordinary tonnage basis; **3.** it is made in small open-hearth furnaces; **4.** of special melting stock; **5.** and is produced by Roebling's special methods; **6.** painstaking care is exercised throughout manufacture.

ROEBLING

THE CUSTOM-MADE WELDING WIRE—FOR EXACTING WELDERS

Ford and Structural Needs Expand

Supply Neutralizer to Slip in Steel Rate to 23 Per Cent—Some Rails and Cars Let—Pig Iron Prices Easier as Steel Quotations Hold

FAVORABLE factors in iron and steel are sufficiently numerous and vigorous to neutralize a decline of 2½ points in the steel operating rate, to 23 per cent, lowest since the third week of April.

Structural steel bookings last week, at 31,886 tons, were the largest in 1932. Ford, attempting to assemble 90,000 cars in June—a 50 per cent increase over May—is distributing more parts and material business. Miscellaneous orders from users long out of the market have appeared in some districts. A little more railroad demand has developed.

Despite last week's recession, May output of steel probably has recouped the loss in April and rebounded to the March rate of 52,000 tons daily, or 24 per cent. On the basis of a trend line for production since 1896, the deficiency in steel since 1929 is estimated at 59,000,000 tons, requiring 13 months at the 1929 average to make up, not counting new demands. Pig iron output in May has approximated the April rate—a little lower, if anything.

Ford unquestionably is distancing the field in automobile production. This is partly at the expense of competitors, as Chevrolet and Plymouth are easing somewhat, but it also represents an energizing of latent buying power. Medium and high-price car manufacturers are slipping into a summer shutdown period, and in June Ford probably will make half of all automobiles.

Two-thirds of last week's structural awards represent federal projects—10,000 tons for a department of agriculture building in Washington and 13,500 tons for a postoffice in New York. In the New York district work requiring 50,000 tons is in the general contractor stage. Inquiry is broad, likely to be greatly accelerated if a relief program by congress includes federal assistance for quasi-public projects.

Fifty gondolas of a special type, requiring 1200 tons of plates and shapes, have been placed by the Wheeling & Lake Erie railroad with the Canton Car Co. This road also is asking repairs to an unstated number of cars, the steel probably duplicating the 50-car order. Western Maryland is taking bids on repairs to 150 cars. New York board of transportation has ordered 3935 tons of rails from the Sweet's Steel Co. Newark, N. J., is buying 1500 tons of rails from the Bethlehem Steel Co.

Toledo has ordered 2000 tons of cast iron pipe, Hamilton, O., 300 tons and St. Paul 250 tons. Standard Oil Co. of Kansas is contemplating a 150-mile steel line. In the Mahoning valley, better demand for sheets and bars is noted, reflecting the automotive situation. For all products, the northern Ohio and southern Michigan districts are stronger than others.

Pig iron is moving better in the lake district, another effect of automotive demand, but is slower elsewhere. Basic iron at Pittsburgh and foundry iron at Philadelphia are off 50 cents. Low prices are an inducement to scrap producers to store their offerings. Bank credit for the scrap industry is tighter.

Talk of higher steel prices for the third quarter is widespread, but it has its origin more in determination than tonnage. Reports put plates, shapes and bars up $1 a ton, sheets $1 to $3, but there is considerable opinion that while more remunerative prices are warranted the volume to sustain them is not in prospect. Forging billets have been marked up $2 a ton, in conformity with other semifinished material. Abandonment of Lackawanna, N. Y., (Buffalo) as a base for plates slightly increases the price to users in that district.

Adjustments in pig iron have depressed the iron and steel composite of STEEL 1 cent this week to $29.57. The scrap composite is off 4 cents to $6.88 but the finished steel index is steady at $47.62.

Composite Market Averages

	May 28	May 21	One Month Ago April, 1932	Three Month Ago Feb., 1932	One Year Ago May, 1931	Ten Years Ago May, 1922
Iron and Steel Composite	$29.57	$29.58	$29.75	$29.56	$31.37	$36.49
Finished Steel Composite	47.62	47.62	47.62	46.72	49.02	52.39
Steelworks Scrap Composite	6.88	6.92	7.76	7.89	10.12	14.67

Iron and Steel Composite:—Pig iron billets, slabs, sheet bars, wire rods, pipe, tin plate, nails, sheets, plates, shapes, bars. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Melting steel, compressed sheets.

Comparative Prices of Iron, Steel and Coke

Representative Market Figures for Current Week, Last Month, Three Months and One Year Ago

	May 28, 1932	April, 1932	Feb., 1932	May, 1931
PIG IRON				
Bessemer, del., Pittsburgh	$16.13	16.76	16.96	18.26
Basic, valley	15.00	15.00	15.00	17.00
Basic, eastern del., eastern Pa.	15.00	15.00	15.75	17.00
No. 2 foundry, del. Pittsburgh	16.26	16.26	16.76	18.26
No. 2 foundry, Chicago	15.50	16.00	16.50	17.50
*Southern No. 2, Birmingham	11.00	11.00	11.20	12.00
**No. 2X, Virginia furnace	18.00	18.00	18.00	18.25
**No. 2X, Eastern del. Phila.	14.76	15.66	15.76	17.76
Malleable, valley	14.50	15.50	15.50	17.00
Malleable, Chicago	15.50	16.00	16.50	17.50
Lake Superior, charcoal, del. Chi.	23.04	23.04	23.04	27.04
Gray forge, del. Pittsburgh	15.63	16.13	16.33	17.63
Ferromanganese, del. Pittsburgh	80.24	80.24	80.24	89.79

*1.75-2.25 silicon. For local delivery. Northern shipments based on $10, Birmingham. **2.25-2.75 silicon.

Delivered pig iron prices subject to 10 per cent freight surcharge, maximum 13.44c per gross ton, beginning Jan. 4, 1932.

COKE				
Connellsville, furnace, ovens	2.15	2.25	2.25	2.45
Connellsville foundry, ovens	3.00	3.25	3.25	3.25
SEMIFINISHED MATERIAL				
Sheet bars, open-hearth, Youngs.	26.00	26.00	25.80	29.75
Sheet bars, open-hearth, Pitts.	26.00	26.00	26.00	29.75
Billets, open-hearth, Pittsburgh	27.00	27.00	27.00	30.00
Wire rods, Pittsburgh	37.00	37.00	37.00	35.00

	May 28, 1932	April, 1932	Feb., 1932	May, 1931
FINISHED MATERIAL				
Steel bars, Pittsburgh	1.60	1.60	1.50	1.65
Steel bars, Chicago	1.70	1.70	1.60	1.75
Steel bars, Philadelphia	1.91	1.91	1.81	1.94
Iron bars, Chicago	1.65	1.70	1.70	1.80
Shapes, Pittsburgh	1.60	1.60	1.50	1.65
Shapes, Philadelphia	1.75	1.75	1.62	1.76
Shapes, Chicago	1.70	1.70	1.60	1.75
Tank plates, Pittsburgh	1.60	1.60	1.50	1.65
Tank plates, Philadelphia	1.79½	1.79½	1.69½	1.85½
Tank plates, Chicago	1.70	1.70	1.60	1.75
Sheets, No. 10 blue anneal., Pitts.	1.70	1.70	1.70	1.85
†Sheets, No. 24, hot, ann., Pitts.	2.20	2.20	2.15	2.25
Sheets, No. 24, galvan., Pitts.	2.85	2.85	2.75	2.80
Sheets, No. 10 blue aneal., Chi.	1.85	1.85	1.90	2.00
†Sheets, No. 24, hot, ann., Chi.	2.35	2.35	2.35	2.40
Sheets, No. 24 galvan., Chi.	3.00	3.00	2.95	2.95
Plain wire, Pittsburgh	2.20	2.20	2.20	2.20
Wire nails, Pittsburgh	1.95	1.95	1.95	1.90
Tin plate, per base box, Pitts.	4.75	4.75	4.75	5.00

†Comparisons are with old classification No. 24 black sheets.

SCRAP				
Heavy melting steel, Pitts.	$9.50	10.20	10.25	11.25
Heavy melting steel, eastern Pa.	6.25	7.20	7.35	9.50
Heavy melting steel, Chicago	6.00	6.55	6.80	8.65
No. 1 wrought, eastern Pa.	7.75	7.95	9.00	11.00
No. 1 wrought, Chicago	5.25	5.85	6.85	8.40
Rails for rolling, Chicago	8.00	8.90	9.85	11.15

Sheets

Price Advances for Third Quarter Expected to Be Announced Soon—Market More Active

SHEET PRICES, PAGE 43

Pittsburgh — Little variation was displayed in last week's sheet specifications for practically all finishes. Mill operations likewise were little changed at 20 to 25 per cent. Declines in the production of some of the higher finishes were offset by temporary gains in output of common sheets. Mills in this district have not received any noticeable impetus from a recent Ford Motor Co. purchase, and automobile specifications in general display but little change. Third quarter prices are withheld and present levels seem firmly established at 2.20c for black, 2.85c for galvanized, and 2.25c for heavy cold-rolled.

Philadelphia — Firmness dominates sheet prices, although tonnage is light. Opinion continues divided as to prospects for an advance for third quarter.

New York — Sheet sales appear lighter than at any time this year. Prices are steady, and some sellers are looking for an advance for third quarter. Youngstown Sheet & Tube Co. has booked 25 tons of No. 10, 16 and 22 sheets for Panama at $1357.50, delivered. Bids close June 7 on approximately 200 tons of one pass cold-rolled, box annealed, pickled and oiled sheets, 0.025-inch thick for the navy yard at Mare Island, Calif., bids to be taken delivered, and f.o.b.

Buffalo—Demand for automobile sheets for quick delivery caused Buffalo district production to increase to 40 per cent during the latter part of May, nearly double the output in the first half. Orders are understood to have been fairly well filled, and it is doubtful if early June production will maintain the 40 per cent rate.

Youngstown, O.—Continued broadening in demand for sheets is noted, the aggregate approaching substantial proportions and maintaining mill operations. Not a great deal of the recent automotive sheet orders were received by valley mills, so sheetmakers take considerable satisfaction in noting the expansion in sales and shipments to miscellaneous consumers. Smaller consumers are getting under way again.

Republic Steel Corp., Youngstown, O., is low on 25,000 sheets, 13 x 61 inches, for automobile tags at 2.90c, delivered, and on an alternate of 250,000 blanks, 6 x 13 inches, at $17.15 per 1000, for Washington.

Cleveland—Sheet prices for third quarter are expected to be announced by some mills within a week or ten days, and apparently will be $1 to $3 a ton higher than current levels. Sheet demand generally has improved, though the local market is comparatively quiet, and makers have decided to take a stronger stand on prices, which have been unprofitable. Black sheets, recently offered in nearby districts in some instances as low as 2.10c or less have firmed up, and there are fewer concessions below 2.20c. Current sheet demand here is comprised mainly of enameling stock, for which there has been some improvement. More inquiries are noted for various grades.

Cincinnati—Sheet users are showing little interest in covering for June or third quarter needs. Production schedules remain unchanged.

Chicago—Announcement of third quarter prices is expected within the next week or two. Higher quotations for that period now are being considered and are expected to materialize shortly. Demand is unchanged and generally quiet, orders remaining in small lots for immediate needs. Operations hold around 20 to 25 per cent. Hot-rolled annealed sheets are 2.30c, mills, and galvanized 2.95c.

Current Finished Steel Prices

Delivered prices subject to freight surcharge corrected to nearest ½c. Asterisk denotes price change this week

Steel Sheets

HOT ROLLED No. 10
(24 to 48 inches wide)

Pittsburgh, base	1.55c
Gary, Ind. Harbor, base	1.65c
Chicago, del.	1.70c
New York, del.	1.90c
Birmingham, base	1.70c
Philadelphia, del.	1.86c

BLUE ANNEALED NO. 9-10

Pittsburgh, base	1.70c
Chicago, district mills	1.80c
Chicago, delivered	1.85c
Philadelphia, del.	2.01c
New York, del.	2.05c
St. Louis, delivered	2.07½c
Birmingham	1.85c
San Francisco c.i.f.	2.30c

HOT ROLLED ANNEALED NO. 24

Pittsburgh, base	2.20c
Gary, Ind. Harbor, base	2.30c
Chicago, del.	2.35c
New York, del.	2.55c
Philadelphia, del.	2.51c
Birmingham, base	2.35c
St. Louis, del.	2.57½c
San Francisco, c.i.f.	2.80c

GALVANIZED NO. 24

Pittsburgh, base	2.85c
Gary, Ind. Harbor, base	2.95c
Chicago, del.	3.00c
Philadelphia, del.	3.16c
Birmingham, base	3.00c
St. Louis, del.	3.22½c
San Francisco, c.i.f.	3.45c

AUTOMOBILE NO. 20

Pittsburgh, base	2.80c to 2.90c

FURNITURE

Pitts., No. 10 heavy	2.65c
Pitts., No. 20 light	3.15c

TIN MILL BLACK NO. 28

Pittsburgh, base	2.40c to 2.50c
Gary, base	2.50c to 2.60c
St. Louis, del.	2.77½c to 2.82½c

HEAVY COLD ROLLED NO. 10

Pittsburgh, base	2.25c
Gary, Ind. Harbor, base	2.35c
Chicago, del.	2.40c
Philadelphia, del.	2.56c
New York, del.	2.60c
St. Louis, del.	2.62½c

COLD ROLLED NO. 20

Pittsburgh, base	2.75c
Gary, Ind. Harbor, base	2.85c
Chicago, del.	2.90c
Philadelphia, del.	3.06c
New York, del.	3.10c
St. Louis, del.	3.12½c

TIN AND TERNE PLATE
Per 100-pound box, Pittsburgh

Tin plate, coke base	$4.75
Long ternes, 24, unassort.	3.00c

Gary, Ind., base 10 cents higher

Wire Products

(Prices apply on straight carloads. Mixed and joint carloads take 10 cents higher price; pool carloads 25-cent advance; less carloads 40-cent advance.)

F.o.b. mills, 100 lb. keg

Standard wire nails	$1.95
Cement coated nails	1.95
Galvanized nails	3.95

(Per pound)

Polished staples	2.50c
Galvanized staples	2.75c
Barbed wire, gal.	2.60c
Annealed fence wire	2.35c
Galvanized wire	2.80c
Woven wire fencing, (9-11 ga.)	$55.00
(12½ ga. and lighter)	$60.00

(To Manufacturing Trade)

Plain wire, 6-9 gage	2.20c
Spring wire	3.20c

Chicago and Anderson, Ind., $1 over Pitts.-Cleve.; Duluth and Worcester, $2 higher; Fairfield, Ala., $3 higher.

Steel Plates

Pittsburgh, base	1.60c
Philadelphia, del.	1.79½c
New York, delivered	1.90c
Boston, delivered	2.02c
Chicago, base	1.70c
Cleveland, del.	1.78½c
Birmingham, Ala., base	1.75c
Coatesville, Pa., base	1.70c
*Pacific Coast, c.i.f.	1.90c
St. Louis, del.	1.97½c

Structural Shapes

Pittsburgh, base	1.60c
Philadelphia, del.	1.75c
New York, del.	1.87c
Boston, del.	2.00½c
Chicago, base	1.70c
Cleveland, del.	1.78½c
Lackawanna, N. Y., base	1.70c
Birmingham, Ala., base	1.75c
Pacific Coast, c.i.f.	2.00c
Do., wide flange	2.10c

Bars

SOFT STEEL

Pittsburgh, base	1.60c
Chicago, base	1.70c
Birmingham, Ala., base	1.75c
Lackawanna, N. Y., base	1.70c
Pacific Coast, c.i.f.	2.00c
Cleveland, base	1.65c
Philadelphia, del.	1.91c
New York, del.	1.90c
Boston, del.	2.02c
Pittsburgh, cold finish	1.75c
Pittsburgh, forg. qual.	1.85c

RAIL STEEL

Chicago Heights	1.50c to 1.60c
Eastern mills	1.30c to 1.35c

IRON

Chicago, base	1.65c
New York, delivered	1.85c to 1.95c
Philadelphia, delivered	1.86c to 1.96c
Pittsburgh, refined	2.70c to 4.20c

REINFORCING

Pitts., billet cut lengths	1.75c
Pitts., stock lengths, mill	1.50c
Chi., billet	1.65c to 1.75c
Chi., rail steel	1.55c to 1.60c
Chi., rail steel, road, bridge and culvert	1.55c
Philadelphia, cut lengths	2.06c
Cleveland, cut lengths	1.75c

Cold-Finished Bars, Shafting

Base Pittsburgh, Chicago, Buffalo and Cleveland, minimum 10,000 lbs. of a kind and grade	1.70c

Corrosion, Heat Resist. Alloys

Base, Pittsburgh

18 per cent chrome, 8 per cent nickel
Sheets, 35c; plates, 31c; bars, 28c.

	A	B	C	D
Bars	19c	20.5c	23c	28c
Plates	21c	22.5c	25c	30c
Sheets	26c	27.5c	30c	35c
Hot Strip	19c	20.5c	23c	28c
Cold strip	25c	26.5c	29c	34c

Carbon 0.12 and under; no nickel. A has chrome 15% and under. B over 15/18% inc., C over 18/23% inc., D over 23/30%.

Wrought Washers

Carloads, Pitts. dist.	$6.50 to 6.75 off
Carloads, Chicago dist.	7.00 to 7.50 off

Alloy Steel

Hot Rolled—F.o.b. Mills
Alloy Quality Bars, 2.65c, mill
(Differentials to various classes of consumers)

S.A.E.	Alloy Diff.	4600 .20 to .30 Mo.	
		1.25-1.75 Ni.	1.05
2000	0.25	5100 .80 - 1.10	
2100	0.55	Cr.	0.45
2300	1.50	51.00 Cr.	
2500	2.25	spring	0.20
3100	0.55	6100 bars	1.20
3200	1.35	6100 Spring	0.95
3300	3.80	Cr., Ni., Van.	1.50
3400	3.20	Carbon Van.	0.95
4100 .15 to .25		9250 (flats)	0.25
Mo.	0.50	9250 (rds.,sq.)	0.50

Strip, Hoops, Bands

Hot strip, to 6 in., Pitts.	1.60c
Do, 6 1/16 to 24-in., Pitts.	1.50c
Hot strip to 6 in. Chi.	1.60c
Do, 6 1/16 to 24-in.	1.50c
Cooperage hoop, Pitts.	1.60c to 1.70c
Do., Chicago	1.70c to 1.80c
Cold-roll, strip, Pitts., Cleve.	2.00c
Worcester, 3 tons over	2.20c

Rails, Track Material

Standard rails, mill	$43.00
Relay rails, Pitts., 20 to 45 lbs.	$21.00 to 23.00
50 to 75	18.00 to 20.00
80 to 100	24.00 to 27.00
Light rails, 25-45, mills	$32.00 to 34.00
Light rails, Chicago	$36.00
Angle bars, mills	2.75c
Spikes, railroad, mills	2.60c
Spikes, railroad, 7/16-in. and smaller, Pitts.	2.60c
Spikes, boat, barge, Pitts.	2.90c
Track bolts, Chicago	3.50c
Do, standard, jobbers	73 off list
Track bolts, Chicago	3.50c
Tie plate, mills	$37.00

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chi. Discounts to legitimate jobbing or large consuming trade for full-case lots apply to May 10, 1930, lists.

CARRIAGE BOLTS

All sizes, cut thread ..... 75 off
Rolled thread ⅜ x 6 and smaller take 10 per cent lower list.
Eagle list ..... 75 off

MACHINE BOLTS

All sizes, cut thread, lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts without nuts ..... 75 off
Tire bolts ..... 60 and 10 off
Stove bolts, 77½, 25 and 10 off in pkgs.; 86 off in bulk.
Rolled thread machine bolts, ⅜ x 6 and smaller take 10 per cent lower list.

NUTS

Semifinished ..... 75 off

HEXAGON CAP SCREWS

Milled ..... 80-10-10-5 off
Upset 1 in. diam. and smaller ..... 85-10 off

SQUARE HEAD SET SCREWS

Milled ..... 80-5 off
Upset, 1 in. and smaller ..... 80-10-5 off
Upset, larger than 1 in. ..... 80-5 off

Cut Nails, Chain, Piling

Cut nails, c.l. Pittsburgh	$2.50
Do. less carloads, 5 kegs or over	$2.90
Less than 5 kegs	$3.05
Chain, BB, BBB, 9/16-1½ in.	33 1/3 off
Sheet piling, Pitts.	1.90c

Rivets

Struc., c.l., Pitts.-Cleve.	2.25c
Struc., c.l., Chicago	2.35c
7/16-in. and smaller, Pitts., Chicago, Cleve.	70, 10 and 5 off

Bars

Demand Fails to Grow but Price Gains Steadiness—Advance for Third Quarter Discussed

BAR PRICES, PAGE 43

Chicago—Steel bar specifications are spotty but generally unchanged. Automotive requirements, although fairly steady, are expected to moderate slightly soon. Prices are described as the most stable in a year. No definite decision has been announced regarding third quarter prices.

New York — With specifications from jobbers, bolt and nut manufacturers and railroads at a standstill trading in steel bars is at a low ebb. Prices are firm.

Philadelphia—Encouraged by firmness of the 1.60c, Pittsburgh, price, most sellers of commercial steel bars here anticipate a $1 advance for third quarter. However, a dearth of demand with no early prospects for improvement brings a dissenting opinion by some. Definite decision is not expected for another week or two. Common iron bars continue 1.60c to 1.65c.

Pittsburgh—The market on carbon bars at 1.60c is without much support so far as demand is concerned, although this price appears firm. As May closed automotive specifications had not materially improved and general consuming lines are as dull as formerly. Despite continued rumor of price advance for third quarter there has been no verification yet. Inquiry for alloy bars appears a shade stronger.

Youngstown, O.—Expansion in demand for common soft steel bars is noticeable, the aggregate, while not large, enabling mills to operate at 30 to 35 per cent. The new demand is coming from a wide variety of consumers, individual lots being small, but showing the an increasing number of small consuming shops have reached the end of their stocks. There is a continued fair demand also for bars for concrete work and from the reviving agricultural implement industry. Soft steel bars are 1.60c, Pittsburgh.

Cleveland—Increasing firmness in the market for common steel bars so far has been expressed principally in the more general insistence on extras which in some instances were falling into disuse, or waived. The going price is 1.65c, base, Cleveland. Though discussion of a price advance for third quarter evidently is more widespread, no announcement has been made. Demand shows moderate improvement, noted especially by some mills in sales to agricultural implement manufacturers.

Tin Plate Demand Holds at Steady Rate

Tin Plate Prices, Page 53

Pittsburgh — Tin mill shipments are fairly steady, while mill operations average 45 per cent. Some tin mills are producing in part for stock, although the output of several is in keeping with actual orders. Canmakers are still deferring much of their expected needs. The present price of $4.75 per base box appears assured for third quarter.

New York—While no formal announcement is likely, it is believed that the current price of $4.75 per base box, Pittsburgh, for tin plate, will be extended on second half contracts.

Youngstown, O.—Independent tin mill operations in this district continue at about 50 per cent. It is expected the New Castle, Pa., mills of the American Sheet & Tin Plate Co. will expand production, as the American Can Co. has increased its output in that city, due to heavier demands for milk cans.

Toronto, Ont.—Maj. Sir Geoffrey Byass, chairman of R. B. Byass & Co., Port Talbot, Wales, reports obtaining large orders for tin plate for his firm in Ontario and Manitoba. Owing to the favorable rate of exchange, British manufacturers can now compete with American producers in the Canadian market.

Cold-Finished Price Is Being Well Received

Cold Finished Prices, Page 43

Pittsburgh — For one large producer of cold-finished steel bars May showed a gain in specifications over April. This appears to have been due to slightly heavier demand in the third week. The present price of 1.70c, minimum, appears to be applied on current spot ordering. Turned and ground shafting has been reduced to 2.05c to 2.50c, Pittsburgh and Cumberland, Md.

Worcester, Mass. — After maintaining a differential of 30 cents above Pittsburgh and Buffalo on cold-finished steel for many years, it is understood that producers here will sell in future at the Pittsburgh or Buffalo base, with freight added.

Plates

Tank Prospects Are Better—Miscellaneous Orders Small—Price Trend Toward Firmness

PLATE PRICES, PAGE 43

Chicago—Despite continued quietness in the plate market, prospects for better tank business are more favorable. Railroads, however, are taking little, and the outlook for line pipe remains dull. Pending work in all descriptions of fabricated plates is small. The market continues 1.70c, Chicago.

Boston—Plate prices are holding at 1.70c, eastern mill, efforts to place business under that figure on carlots having been resisted. Demand is light, buying being almost entirely for small lots.

Pittsburgh—Barge activity still is making a fairly good showing. District mills are awaiting the engineers' opening at Memphis, Tenn., June 1 on two derrick barges and a local mill will fabricate a 650-ton drag-line dredge for a New Orleans customer. General demand for plates still is restricted, and 1.60c, base, is the market.

New York—Plate demand here is featureless, and prices are unchanged. It is understood the Lackawanna, N. Y., base on plates has been eliminated. Figuring 25½ cents freight from Pittsburgh to Buffalo, consumers in Buffalo now are paying 1.85½c, compared with the recent Lackawanna base of 1.70c.

Philadelphia—Approximately 200 tons of plates are active for caissons for a bridge at Annapolis, Md., on which the Empire Contracting Co., Baltimore, is general contractor. Miscellaneous demand is exceedingly light, although prices are steady at 1.70c, Coatesville.

Cleveland—Plate demand here is comprised mainly of small lots. The largest pending tonnage is that for 50 Wheeling & Lake Erie railroad

gondola cars awarded to the Canton Car Co., Canton, O., requiring approximately 1200 tons of steel, mainly plates. The local 112 and 152-inch plate mills operated three days last week and are scheduled for three this week. Plates are firm at 1.60c, Pittsburgh.

Contracts Placed

650 tons, drag-line barge for 750-ton drag-line machines, unstated customer, New Orleans district, to Jones & Laughlin Steel Corp., Pittsburgh. Barge to be 180 x 54 x 9 feet.

200 tons, covered water tank, Fort Bliss, Texas, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

145 tons, fuel tanks, state hospital, Brooklyn, N. Y., to Harlem Engineering Co., New York.

135 tons, tank, boys' training school, Warwick, N. Y., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

Unstated tonnage, rolled nickel steel bearing plates, overhaul Pacific locks, Panama canal, to Reading Iron Co., Reading, Pa.

Unstated tonnage, 300 floor plates, Panama, to Central Iron & Steel Co., Harrisburg, Pa.

Contracts Pending

200 tons, caissons, state bridge, Annapolis, Md., Empire Contracting Co., Baltimore, general contractors; this in addition to 500 tons of shapes, previously noted.

200 tons, gasoline storage tanks, two at Langley Field, Va., and two at Mitchell Field, N. Y.; bids June 22. Also two each for Selfridge Field, Mich., Maxwell Field, Ala., and Hamilton Field, Calif.; bids June 22.

Wire Buying Steady but Still in Small Volume

Wire Prices, Page 43

Chicago — Wire products are steady as regards shipments and specifications. Orders represent immediate requirements, with slight change in demand in early prospect. Market continues $2 in carload lots for wire nails and 2.25c for plain wire.

Worcester—Wire buying and mill operations are light, activity being centered largely on specialties.

Pittsburgh—Nail and wire orders this month have failed to improve over April. Intimation is prevalent that there will be no change for third quarter from present quotable levels of 2.00c for plain bright wire and $1.95 for nails, but no announcement has been made.

Youngstown, O.—Wire products continue in steady demand, with wire itself making up most of the business, since nails are slow.

Cleveland—Some fairly good orders for wire have been received. Buying in farm areas is holding up.

Railroads

Wheeling & Lake Erie Buys 50 Cars—Western Maryland Asks Bids on Remodeling 150

TRACK MATERIAL PRICES, PAGE 43

Chicago—Releases of track fastenings are maintaining their recent rate, orders for the week amounting to about 2000 tons. There is no change in volume of new business or inquiry for rails or car material, although recent demand for repair equipment has moderated slightly. Operations of rail and fastening mills are fairly steady. The outlook in the car market is indefinite, but it is believed that locomotive builders will be the first to experience an improvement in equipment buying by the carriers.

New York—Seaport Contracting & Supply Co., 7 Battery Place, representing Sweet's Steel Co., Williamsport, Pa., has been awarded 3500 tons of 150-pound contact rail and 435 tons of 60-pound contact rail by the local board of transportation. This is the first time, it is said, that Sweet's Steel Co. has accepted standard rail of this weight. Deliveries are in three to four months, with the contract involving more than $200,000.

The company bid 2.52c and 2.42c, f.o.b. cars, New York, on the 150-pound rail, No. 1 and No. 2, respectively, and 1.98c and 1.89c, f.o.b. cars, on the 60-pound rail, No. 1 and No. 2, respectively. Bethlehem Steel Co., only other bidder, quoted 2.60c, and 2.51c on the 150-pound rail, No. 1 and No. 2, respectively; and cold-rolled, 2.00c, Pittsburgh.

New York — Western Maryland railroad is asking bids on conversion of 150 steel gondolas of 70 tons capacity into drop-end gondolas. The Pennsylvania railroad will open bids June 9 on steel tires and structural steel.

Pittsburgh—Contrary to expectations of a week ago when the local rail mill began rolling presumably for a two week period, operations were suspended late last week. Railroad specifications for steel products still are restricted but some encouragment has developed from the Pennsylvania railroad's receipt of credit extension by the Reconstruction Finance Corp. Part of these funds may benefit the steel industry in that unfilled orders for the Pennsylvania's electrification plans in the East may be released.

Cleveland—Wheeling & Lake Erie railroad has awarded fifty 65-foot gondola cars to the Canton Car Co., Canton, O., which will require approximately 1200 tons of steel. Used trucks will be utilized. Moderate repairs to an unstated number of cars also will be placed shortly by this railroad. Current rail demand is restricted to small orders for industrial purposes.

Denver—Colorado Fuel & Iron Co. plans to overhaul its rail mill at Pueblo, Colo., at a cost of $100,000, giving employment to about 300 men.

Car Orders Placed

Union Tank Car Co., 10 tank cars, to Graver Tank & Mfg. Corp., Chicago; previously reported as 5 tanks.

Wheeling & Lake Erie, fifty 65-foot gondolas, to Canton Car Co., Canton, O.

Rail Orders Placed

3935 tons, mostly 150-pound rail, board of transportation, New York, to Seaport Contracting & Supply Co., representing Sweet's Steel Co., Williamsport, Pa.

Newark, N. J., 1500 tons 100-pound rail for subway section, to Bethlehem Steel Co.

Bolt, Nut Orders Are Slow; Prices Steady

Bolts, Nuts, Rivets Prices, Page 43

Pittsburgh—Specifications in May showed no change from April. Requirements of larger consuming groups still reflect cautious buying. Prices of 75 off list for bolts and nuts and 2.25c, Pittsburgh, for large rivets apparently are applied without difficulty.

Cleveland—Orders from automotive builders are larger, especially from Chevrolet and Ford. Jobbers ordered fairly heavily in March for six weeks or more in advance at the low prices then going and business from that source does not show appreciable improvement. Prices are firm, there being less competition, makers having ceased efforts to obtain volume at the expense of prices.

Chicago — Bolt, nut and rivet specifications are slow and incoming business is off slightly from a month ago. Announcement of third quarter prices is lacking but no change is anticipated from 75 off for bolts and nuts and 2.35c, Chicago, for structural rivets.

Structural Shapes

Week's Awards, Over 31,000 Tons, Include 23,500 Tons For Two Federal Buildings —New Inquiry Holding Up —More Large Projects Approaching Closing Stage

STRUCTURAL SHAPE PRICES, PAGE 43

New York — Structural tonnage continues to mount in the East, close to 50,000 tons being active, general contract bids being in on a good portion, and awards made in some instances. About 4000 tons are active for New York and New Jersey bridges. On plain material 1.60c, Pittsburgh, apparently is holding, but fabricated and erected steel quotations show a wide range.

Boston—Structural tonnage pending is limited largely to postoffice and other public work, bids going in on several for New England this week. Prices on plain material are steady at 1.70c, eastern mill.

Philadelphia — While some releases have been made by the Pennsylvania railroad, fabricators do not look for the resumption of the railroad's program to be fully felt for at least 30 to 60 days. The Pennsylvania will take bids June 9 on miscellaneous structural shape requirements.

McCloskey & Co., this city, are low for the Washington, D. C. postoffice, requiring 8400 tons, and the Seeds & Derham Co. this city, are low on the Monmouth county, New Jersey, bridge over Shrewsbury river, involving 2500 tons. Shape prices continue firm at 1.70c eastern mill.

Pittsburgh — Fort Pitt Bridge Works Co., Pittsburgh, has closed on 10,000 tons for the extensible building, department of agriculture, Washington. The plans have just been released on an Erie grade crossing job at Oswego, N. Y., to take a tonnage of large girder spans. Federal work in the East still proves the most attractive field for local fabricating interests. Bids on a 71-ton bridge for Huntingdon county, Pennsylvania, go in to the state June 3. Operations by the largest fabricator in this district last week were down to 10 per cent. Mill specifications for plain material generally are on the basis of 1.60c, Pittsburgh.

Cleveland—In contrast with substantial public work awards in eastern territory, practically all structural jobs current here are for private interests, and individually are light. Typical jobs figure to 50 to 75 tons, and in the aggregate are fairly good. Fort Pitt Bridge Works Co., Pittsburgh, took 110 tons for an Ohio state bridge. Action is nearing on a number of important projects in this district, plans being expected soon for the Cleveland postoffice superstructure, requiring 7000 to 8000 tons. Plain shapes are firm at 1.60c, Pittsburgh.

Chicago—Structural inquiry is quiet and the majority of new projects still represent public work. Illinois state highway commission will take bids next month on 2000 tons of structural material for road and bridge work. A fair amount of work still is pending, though operations by smaller fabricators are tending downward. The market on plain shapes continues 1.70c, Chicago.

Birmingham, Ala.—New business is light. Structural fabricators are operating at slightly more than 25 to 30 per cent.

Contracts Placed

13,500 tons, postoffice annex, New York, to McClintic-Marshall Corp., Bethlehem, Pa.

10,000 tons, extensible building, department of agriculture, Washington, to Fort Pitt Bridge Works, Pittsburgh, through Aronberg-Fried Co., New York, general contractors.

1000 tons, bridge, Chippewa, Wis., to Worden-Allen Co., Milwaukee.

700 tons, Illinois highway bridges, divided among Midland Structural Steel Co., Chicago; Vincennes Bridge Co., Vincennes, Ind.; and Wisconsin Bridge & Iron Co., North Milwaukee, Wis.

700 tons, General Exhibit building, Century of Progress exposition, Chicago, to American Bridge Co., New York.

Awards Compared

	Tons
Awards, week ended May 28	**31,886**
Awards, week ended May 21	**20,623**
Awards, week ended May 14	**5,549**
Awards, this week in 1931	**34,106**
Av. weekly awards, 1931....	**34,236**
Av. weekly awards, 1932....	**14,647**
Av. weekly awards, April..	**11,527**
Awards to date, 1931	**852,625**
Awards to date, 1932.....	**322,234**

640 tons, public school No. 248, New York, to Bethlehem Fabricators Inc., Bethlehem, Pa.

500 tons, bridges, Virginia & Western railroad, West Virginia, to American Bridge Co., Pittsburgh.

500 tons, high school, Pottstown, Pa., to Bethlehem Fabricators Inc., Bethlehem, Pa.

378 tons, agricultural group buildings, Century of Progress exposition, Chicago, to Wendnagel & Co., Chicago.

360 tons, transit shed and warehouse, Richmond, Va., to unnamed fabricator.

350 tons, Indiana highway bridge, divided, 145 tons to Vincennes Bridge Co., Vincennes, Ind., remainder to Continental Bridge Co., Chicago; Bedford Foundry & Machine Co., Bedford, Ind., and Central States Bridge & Structural Co., Indianapolis.

311 tons, boiler house, Glen Alden Coal Co., Scranton, Pa., to Bethlehem Fabricators Inc., Bethlehem, Pa.

295 tons, bridge, Nelson county, Kentucky, to International Bridge Co., Evansville, Ind.

248 tons, El Capitan dam, San Diego, Calif., to unnamed interest.

225 tons, building for Metal Products Co., Cincinnati, to unstated fabricator.

200 tons, marine hospital, Louisville, Ky., to Duffin Iron Co., Chicago.

200 tons, bridge, Hammondsport, N. Y., to Lackawanna Steel Construction Co., Buffalo.

170 tons, substation, West Hollywood, Calif., to McClintic-Marshall Corp., Bethlehem, Pa.

150 tons, bridge, Emporia, Kans., to Kansas City Structural Steel Co., Kansas City, Mo.

130 tons, high school, Kutztown, Pa., to Progressive Iron Works, Reading, Pa.

130 tons, highway bridge, Steuben county, New York, to F. L. Heughes & Co., Rochester, N. Y.

130 tons, Harvard Congregational church, Brookline, Mass., to New England Structural Co., Boston.

125 tons, bridge, Cohocton, N. Y., to Lackawanna Steel Construction Co., Buffalo.

125 tons, building, Idaho Falls, Idaho, to Minneapolis-Moline Power Implement Co., Minneapolis.

125 tons, building at Christopher and Fourth streets, New York, to Empire Architectural Iron Works, Bronx, N. Y.

110 tons, state bridge, Ohio, to Fort Pitt Bridge Works Co., Pittsburgh.

109 tons, shapes and bars, bridge No. 1298, West Virginia, to Wheeling Structural Steel Co., Wheeling, W. Va.

100 tons, shop and shed, Delaware, Lackawanna & Western railroad, Elmira, N. Y., to R. S. McManus, Buffalo.

100 tons, state bridge No. 1308, West Virginia, to Virginia Bridge & Iron Co., Roanoke, Va.

100 tons, store, W. T. Grant Co., Jersey City, N. J., to Maxwell, Spiro & Co., Jersey City.

100 tons, state bridge No. 1293, Hardy county, West Virginia, to Brookville Bridge Co., Brookville., O.

Contracts Pending

8400 tons, postoffice, Washington; McCloskey & Co., Philadelphia, low on general contract.

2500 tons, high school, Scranton, Pa.,

general contract awarded to William Steele & Sons, Philadelphia.
2485 tons, bridge, Shrewbury river, Highlands and Seabright, Monmouth county, N. J.; Seeds & Derham Co. Philadelphia, low on general contract.
2000 tons, bridges, Illinois state highway commission; bids June 8 and 15.
1420 tons, viaduct over Waverly yards, Newark, N. J.; state bids June 13.
1000 tons, New York Central railroad building, west side, New York.
800 tons, postoffice, Paterson, N. J.
800 tons, drink hall, Saratoga Springs, N. Y.; state project.
750 tons, garage, Philadelphia Savings Fund society, Philadelphia.
550 tons, highway bridge, Wisconsin.
500 to 600 tons, cableway for Six Companies, Boulder City, Nev.; bids opened.
400 tons, powerhouse, Vernon, Calif.; bids opened.
400 tons, public school, Jackson Heights, N. Y.
350 tons, armory, Jamestown, N. Y.; Longacre Engineering Co., New York, general contractor.
300 tons, shapes and bars, barracks and other buildings, Hamilton Field, Calif., bids June 20, quartermaster.
300 tons, farm buildings, John D. Rockefeller Jr. estate, New York.
275 tons, Garwood Ferry bridge, Stockton, Calif.; bids opened.
250 tons, Trumbull dormitory, Yale university, New Haven, Conn.
250 tons, four-story building, Springfield Safe Deposit & Trust Co., Springfield, Mass.; A. E. Stephens, Springfield, contractor.
250 tons, shapes and bars, postoffice addition, Billings, Mont.; Rosen & Fischel Inc., Chicago, low.
250 tons, postoffice, Jefferson City, Mo.
217 tons, bridge in San Juan county, N. Mex., bids May 25.
165 tons, Montgomery county bridge, Pennsylvania; Albert P. Driscoll, Germantown, Pa., general contract.
200 tons, postoffice, Norristown, Pa.; Ralph S. Herzog, Philadelphia, low on general contract.
150 tons, Grant store, Oakland, Calif., bids opened.
150 tons, jail, Ithaca, N. Y., bids June 11.
130 tons, intercounty bridge, between Montgomery and Bucks counties, Telford, Pa.; Harry Dupew, Bangor, Pa., low on general contract.
Unstated tonnage, girder spans grade crossing elimination, Oswego, N. Y., for Erie railroad.

'Yankee Ingenuity' Survives

Citizens of Connecticut were granted more patents in 1930 and 1931 than those of any other state, the New England council points out. Since 1927 Connecticut, Massachusetts, Rhode Island and New Hampshire have been above the national average. In 1931 New England citizens won 4810 patents, or 10.1 per cent of the total, compared with 3679, or 9.4 per cent, in 1927.

McConnell Bronze Casting Co., recently organized, has started operations at 2950 Penn avenue, Pittsburgh, occupying the plant of the former Hill-Wallisch Bronze Co. E. E. McConnell is president and A. G. Mercer, secretary-treasurer.

Concrete Bars

Substantial Tonnages Developing in Highway Work In Numerous States—Lettings at 4274 Tons Show Improvement — 1200 Tons Placed for San Diego Dam

REINFORCING BAR PRICES, PAGE 43

New York—Reinforcing steel lettings have diminished, although several thousand tons are active in this district. Fresh inquiry includes moderate tonnages. Bridge and highway work pending is slightly heavier. More than a 1000 tons are up for New Jersey bridges on which general contract bids are in.

Philadelphia — While substantial work is pending, buying of reinforcing bars recently has been devoid of outstanding tonnage. Early action is expected on 700 tons for the Scranton, Pa., high school, for which William Steele & Sons, this city, have been awarded the general contract. Prices appear firmer at 1.75c, Pittsburgh, for material in cut lengths.

Boston—Three highway contracts, taking close to 600 tons, were placed with as many distributors, rerolled, foreign and domestic material being included. Prices are easy, structural billet material being influenced adversely by rail and imported bars.

Pittsburgh—Mill shipments of reinforcing steel are failing to improve, yet show no evidence of declining. Small orders predominate, but award has been announced on a 500 and 600-ton job in the East. Foreign steel in that district still is making inroads. Two Pennsylvania state highway lettings, June 2 and June 3, call for several reinforced roadways and small bridges. Reinforcing bars, stock lengths, generally are 1.50c, Pittsburgh.

Cleveland—Road work continues the best outlet for concrete bars. Individual requirements are light. For a highway at Ashtabula, O., 250 tons has been awarded to the American Bridge Co., through the Paterson-Leitch Co., Cleveland. The general contract for the westerly sewage disposal plant, Cleveland, requiring more than 100 tons has been awarded to the Hunkin-Conkey Construction Co., Cleveland.

Chicago—Road work still predominates in the reinforcing bar market. Awards are light but fair tonnages are pending for nearby states. Private work is quiet and awards and inquiry usually involves lots of less than 100 tons.

Birmingham, Ala.—Recent bookings do not warrant any speeding up of output. Road work has shown but little demand so far.

Awards Compared

	Tons
Awards, week ended May 28	**4,274**
Awards, week ended May 21	**3,275**
Awards, week ended May 14	**5,248**
Awards, this week, 1931	**12,357**
Av. weekly awards, 1931	**6,808**
Av. weekly awards, 1932	**4,443**
Av. weekly awards, April	**4,661**
Awards, to date, 1931	**158,384**
Awards to date, 1932	**97,751**

Contracts Placed

1200 tons, El Capitan dam, San Diego, Calif., to unnamed interest.
600 tons, Troy-Menando bridge, N. Y., to Joseph T. Ryerson & Son Inc., Chicago.
500 tons, plant Hershey Chocolate Co., Hershey, Pa., to Taylor-Davis Inc., Philadelphia.
291 tons, Union Pacific railroad, cutoff, Long Beach, Calif., to Pacific Coast Steel Corp., Los Angeles.
250 tons, highway, Sandusky, O., to American Bridge Co., New York, through Paterson-Leitch Co., Cleveland.
250 tons, Banning Creek dam, Prescott, Ariz., to S. A. Spear, Phoenix, Ariz.
200 tons, state highway, Woodbury, Vt., to Truscon Steel Co., Youngstown, O.
175 tons, state highway and bridge widening, Pittsfield, Mass., to Northern Steel Co., Boston.
174 tons, West Boulevard bridge, Los Angeles, to unnamed interest.
170 tons, state highway, Montpelier-Plainfield, Vt., to Concrete Steel Co., Boston.
150 tons, Illinois state highway, to Concrete Steel Co., New York.
114 tons, Cincinnati street improvement, to West Virginia Rail Co., Huntington, W. Va.
100 tons, foundations for postoffice, Phoenix, Ariz., to unnamed interest.
100 tons, state highway, Washington and Beaver counties, Pennsylvania, to Electric Welding Co., Pittsburgh.
Unstated tonnage, postoffice, Miami, Okla., to Truscon Steel Co., Youngstown, O.

Contracts Pending

1000 tons, road work, Wisconsin.
600 tons, highway route No. 42 from

Woods Corner to Williamstown, N. J.; bids June 13.
380 tons, state viaduct over Waverly yards, Newark, N. J., bids June 13.
200 tons, building, Chicago Century of Progress exposition, for General Motors Corp.; Lundoff-Bicknell Co., Chicago, general contractor.
140 tons, bridge in San Juan county, N. Mex., bids May 25.
114 tons, highway work on Benson-Douglas highway, Phoenix, Ariz., bids opened.
100 tons, bank building, Springfield, Mass.
100 tons, state armory, Jamestown, N. Y., Longacre Engineering & Construction Co., New York, general contractor.
100 tons, health unit No. 7, Boston.
100 tons, warehouse, Tenth avenue, New York; Turner Construction Co., New York, general contractor.
Unstated tonnage 3000 steel reinforcing bars, highway department, Washington.

Commercial Forging Billet Prices Advanced

Semifinished Prices, Page 50

Cleveland—Some makers have advised consumers that commercial forging billets will be advanced $2 per ton for third quarter, in line with the $2 advance announced recently for billets, sheet bars and slabs. Commercial forging billets have been selling at the same price as ordinary billets, namely $26 base, Cleveland, Youngstown, and Pittsburgh. Forging billets of guaranteed quality hold at $33.

Pittsburgh — Semifinished users still are specifying small lots, with the market generally $26 for billets, sheet bars and slabs. Forging billets are firm at $33 base. Practically the only encouragement in the market today is in price firmness, and present assurance that an advance of $2 a ton on sheet bars, billets and slabs will be effected for third quarter. On two fairly sizable orders for wire rods last week the $37 base was firm.

Philadelphia—While rerolling billets are scheduled higher for third quarter, the current market here continues around $31.748, delivered, with forging quality at $37.748. Demand is as light as at any time, with a negligible tonnage moving.

Youngstown, O.—Consumers of semifinished steel in nonintegrated plants in this district apparently show no more than academic interest in the announced third-quarter price advance of $2 a ton on sheet bars, billets and slabs. Sheet bars still lead billets in volume of shipments.

Chicago—Sheet bar demand continues extremely quiet. Despite lack of formal announcement, producers plan to increase prices for third quarter, the market currently being $28.

Pipe

Demand for Cast Pipe Slower —Toledo, O., Places 2000 Tons —150-Mile Oil Line Planned

PIPE PRICES, PAGE 58

Chicago—New inquiry for cast pipe is quiet, problems of financing deferring considerable work in many municipalities. Hamilton, O., has placed 300 tons of 12-inch pipe, while Lynchburg Foundry Co., Lynchburg, Va., is low on 1024 tons of 4 and 12-inch pipe for Chicago. Work still is pending at St. Louis and St. Paul. Toledo, O., has placed 2000 tons of 6 to 24-inch cast pipe.

Boston — Cast pipe buying has slumped, with few exceptions volume being confined to small lots. Prices are weak. Steel pipe also is dull, lack of building slowing demand. Several hundred tons will be required for the Christian Science publishing house project here.

New York—Cast pipe lettings are mainly in small lots on which better prices are being obtained, although on orders of 100 tons and more prices still are easy at $22 to $23, eastern foundry. Inquiry is light, several hundred tons being required for state and other public work. Hershey, Pa., bought 2100 tons from the Emaus, Pa., foundry.

Philadelphia—Bids will be opened June 1 on approximately 250 tons of 20-inch steel pipe by the local United States engineer.

Pittsburgh—The sole hope pipe producers have in bettering their present 10 to 15 per cent operating rate appears to be in successful financing of pending pipe lines, as standard pipe demand still is the dullest in many years. Allocation of the recently placed 8000-ton Iraq line is proceeding. It is reported that a large oil line in Venezuela may develop as business for American mills.

Youngstown, O.—The largest pipe line project in which makers here are interested is the 150-mile extension planned by the Standard Oil Co. of Kansas, just announced by the company's Wichita offices. A fair amount of buttwelded pipe business is current, and there is an appreciable increase in demand for the smaller sides of seamless tubing, from miscellaneous sources.

Cleveland—A considerable portion of the 8000-ton steel pipe order from the Iraq Petroleum Co., awarded recently to American mills, will be produced at the Lorain, O., plant of the National Tube Co., preparations for which have already started, and will give work to a number of additional employes. New construction work in the Cleveland district is quiet, orders for tubular goods remaining small.

Birmingham, Ala.—Operations of pressure pipemakers is below 30 per cent. Few specifications are reported and backlogs are being steadily worked on, shipments still being fairly good.

Cast Pipe Placed

2100 tons, 30-inch, Hershey, Pa., to Donaldson Iron Works, Emaus, Pa.
2000 tons, 6 to 24-inch, Toledo, O., to James B. Clow & Sons, Chicago.
500 tons, 8 and 10-inch, additional, Mount Vernon, N. Y., to Donaldson Iron Works, Emaus, Pa.
400 tons, El Capitan dam, San Diego, Calif., to unnamed interest.
300 tons, 12-inch, Hamilton, O., to United States Pipe & Foundry Co., Burlington, N. J.
300 tons, state job, Newburgh, N. Y., to United States Cast Iron Pipe & Foundry Co., Burlington, N. J.
250 tons, St. Paul, to Central Foundry Co., New York.
121 tons, up to 24-inch, New York state highway, to Donaldson Iron Works, Emaus, Pa.
112 tons, special castings, Boston, to Warren Pipe & Foundry Co., Wharton, N. J.

Steel Pipe Placed

Unstated tonnage, 8400 feet, 36-inch, water department, St. Louis, to McClintic-Marshall Corp., Bethlehem, Pa.
Unstated tonnage, 10,000 feet, 3-inch and 20,000 feet, 1-inch, galvanized Panama, to Laclede Tube Co., St. Louis.
Unstated tonnage, 430 boiler tubes, United States engineer, Galveston, Tex., to John B. Anstell Co. Inc., New York.
Unstated tonnage, 1500 feet, 20-inch shore pipe, Jacksonville, Fla., to Chicago Bridge & Iron Works, Chicago.
Unstated tonnage, shore pipe, United States engineer, Wilmington, N. C., to Welded Products Corp., Birmingham, Ala.

Cast Pipe Pending

1024 tons, 4 and 12-inch, Chicago; Lynchburg Foundry Co., Lynchburg, Va., low.

Steel Pipe Pending

Unstated tonnage, 1500 feet, 20-inch I.D. rivet weld special steel shore discharge pipe, United States engineer, Jacksonville, Fla.; bids June 10.

P. J. Sonner Gas Burner Co., Winfield, Kans., has changed its name to Sonner Burner Co. P. J. Sonner is president and general manager.

Strip

Volume of Buying Better and Higher Third Quarter Prices in Prospect—Inquiry Gains

STRIP PRICES, PAGE 43

Pittsburgh—Some hot and cold-rolled strip inquiry is coming out for third quarter, including that of a large automobile manufacturer in the Detroit district but mills are deferring actual closing. Hot-rolled advances are being considered above the present market of 1.50c and 1.60c, Pittsburgh, depending upon width. The 2.00c, Pittsburgh, base for cold-rolled is decidedly dull and likewise is awaiting some determination as to third quarter price policy.

New York—Small, scattered lots characterize strip buying here, volume varying little from week to week. Hot strip is 1.40c and 1.50c, Pittsburgh, for the wide and narrow, respectively; and cold-rolled, 2.00c, Pittsburgh.

Philadelphia — Cold-rolled strip continues quiet at 2.00c, Pittsburgh, and hot-rolled at 1.40c and 1.50c, Pittsburgh. Radio specifications are virtually absent at the moment.

Youngstown, O.—While strip business continues to expand somewhat, little proportionately is coming from the automotive industry and Ford orders are not large. Other lines of consumption of both hot and cold-rolled strip are taking more material, in small lots. Strip mills in this district have increased operating rates to between 30 and 40 per cent.

Cleveland—The volume of strip steel sales for May will exceed that for April, due mainly to improvement in orders received in the last half of the month. Current requirements are of a miscellaneous character, no further contracts of consequence having been placed here for automotive work. Hot-rolled strip is 1.40c and 1.50c, Pittsburgh, for wide and narrow widths, respectively, and cold-rolled, 2.00c, Cleveland.

Chicago—Announcement is lacking regarding an advance in prices. Quotations have been fairly steady recently at 1.50c and 1.60c for hot strip, and 2.00c for cold-rolled strip.

Operations Ease Off to 23 Per Cent; May Average 24

Pittsburgh — Steel ingot production closed last week at 21 per cent, but this week will be easier at barely 20. Steel production in some of the smaller independent plants is steadiest. The local rail mill completed a one week's rolling late last week. Sheet output is unchanged at 20 to 25 per cent; tin mill output is holding at 45; pipe production is easier at 10 to 15.

Philadelphia—Steel ingot operations were unchanged last week at 13-14 per cent, and the same rate will apply this week.

Buffalo—Operations here dipped to the low point of recent months during the week ending May 28, reaching 14 per cent, or five out of 37 open hearths active the greater portion of that period. One works with staggered production discontinued ingot output; another dropped three more open hearths.

Operations, week ended May 28	**23**
Operations week ended May 21	**25.5**
Operations, week ended May 14	**24**
Operations, this week, 1931....	**41**
High for 1932, Feb. 6.....	**28.5**
Low for 1932—Jan. 2, Apr. 9, 16	**22**

Youngstown, O.—Steel plant operations in the week ended May 28 averaged 24 per cent, off one point. Little change is anticipated for this week. Out of 83 open hearths, 25 are melting. A year ago operations were at 41 per cent.

Cleveland—Steel ingot production held at 38 per cent during the week ended May 28, and is scheduled for the same rate this week. Otis Steel Co. has in operation four open hearths; Corrigan, McKinney Steel Co. four, and American Steel & Wire Co., five. Otis company's 112 and 152-inch plate mills will be on three days this week, the same as last; its 24 and 72-inch strip mills, on last week, also are scheduled this week.

Chicago—Operating rates generally are unchanged. Ingot production during the past week maintained its recent rate of slightly above 20 per cent, with only minor variations in prospect during the coming week. Blast furnace operations remain on the basis of eight active steelworks stocks out of 36 in the district. Sheet output is unchanged at 20 to 25, while strip is slightly higher at 18.

Birmingham, Ala.—Steel ingot production, which has been holding at about 45 per cent, dipped to 23 when the Ensley mill of the Tennessee Coal, Iron & Railroad Co. went down. Four to five open hearths are on at the Fairfield works of the Tennessee company, and two intermittently at the Gulf States Steel Co. works at Gadsden.

Warehouses Adopting New Extras on Cold-Finished

Warehouse Prices, Page 58

Cincinnati—Warehouses have put into effect a new base price on cold finished steel. Rounds and hexagons are down to 3.29c from 3.50c, and flats and squares are now 3.79c. New quantity differentials on the same materials are: 1000 pounds or more of a grade and size, base; 999 to 500 pounds, 25.00c per 100 pounds; 499 to 300 pounds, 75.00c per 100 pounds; 299 to 100 pounds, $1; less than 100 pounds, $1.25. Demand continues unchanged.

New York—Warehouse volume is steadier, fluctuations being less sharp, although the total still is light. Prices are generally unchanged and holding fairly well on most products. Cold finished demand is dull and no price adjustments have been made in line with recent mill price changes up to now.

Philadelphia—Jobbers are concluding a duller month than in April, with the usual seasonal influences entirely absent. Prices are steady.

Pittsburgh—May closed a month comparable in most products to April. However, one local distributor of sheets reports the last week of May its best for 1932. The price of cold-finished steel has been revised with the base now 2.95c and changed quantity extras.

Cleveland—Warehouse prices on cold-finished steel will be adjusted this week in line with the single base price of 1.70c, and new quantity extras recently announced by cold-finished bar manufacturers.

Detroit—Warehouse business in iron and steel shows little change, and the May total will approximate that of April. Prices are steady. The new warehouse quantity extras on cold-finished steel, applying to purchases of 999 pounds or less of a size and grade at one time have been generally adopted in this district.

Chicago—Sales from warehouse continue to tend downward slightly, with no marked change in activity in any particular product. An early revision in prices of cold finished steel bars is anticipated. Quotations are unchanged.

Raw Material Prices

Delivered pig iron prices subject to 10 per cent freight surcharge, maxi num 13.44c gross ton, from Jan. 4

Pig Iron

Per Gross Ton

FOUNDRY, NO. 2

Chicago furnace	$15.50 to 16.00
Pittsburgh, dist. fur.	15.50
Pittsburgh, delivered	16.13 to 16.63
Valley furnace	14.50 to 15.00
Cleveland fur., local del.	15.50
Philadelphia, delivered	14.26 to 14.76
Virginia furnace	17.50
Granite City, Ill., fur.	16.50 to 17.50
Buffalo, fur., local del.	16.00
Buff., all-rail, Boston	19.91 to 20.41
Buff., all-rail, Brooklyn	18.90 to 19.40
Buff., all-rail, Newark	17.28 to 17.78
Ala., Bir. fur., local del.	11.00
Ala., Nor. del., Bir. base	10.00
Alabama, del. Chicago	16.01
Alabama, del. St. L.	14.42
Alabama, del. Cincinnati	13.82
Ala., Phila., dock del.	15.00 to 15.25
Ala., Balt., dock del.	15.00
Alabama, New York dock	15.50
Ala., Boston dock del.	16.50 to 16.75
Tenn., Bir. base, local del.	13.00
Tennessee, del. Cinn.	13.82
Montreal, delivered	23.00 to 23.50
Toronto, delivered	22.10

FOUNDRY, NO. 2X

Buffalo, fur., local del.	16.50
Buff., all-rail, Brooklyn	19.40 to 19.90
Buffalo, all-rail, Newark	17.78 to 18.28
Buff., all-rail, Boston	20.91 to 21.41
Virginia furnace	18.00
Eastern, del. Phila.	14.76 to 15.26

FOUNDRY, NO. 1X

Buffalo fur., local del.	17.50
Eastern, del. Phila	15.26 to 15.76

MALLEABLE

Valley furnace	14.50 to 15.00
Cleveland fur., local del.	15.50
Pittsburgh dis. fur.	15.50
Pittsburgh, delivered	16.13 to 16.63
Chicago, furnace	15.50 to 16.00
Buffalo fur., local del.	16.50
Eastern Penna., delivered	16.13 to 19.41
Granite City, Ill., fur.	16.50 to 17.50
Montreal, delivered	24.00
Toronto, delivered	22.60

BASIC

Pittsburgh, district fur.	14.50 to 15.00
Pittsburgh, delivered	15.13 to 16.13
Eastern Penn., del.	15.00
Buffalo fur., local del.	15.50 to 16.00
Montreal, delivered	23.50
Valley, furnace	14.00 to 14.50

BESSEMER

Valley furnace	14.50 to 15.00
Pittsburgh, furnace	15.50
Pittsburgh, delivered	16.13 to 16.63

LOW PHOS.

Valley fur., standard	25.00
Philadelphia, standard	23.76 to 26.79
Copper-bear., E. Pa. fur.	21.50 to 23.00

GRAY FORGE

Valley furnace	14.00
Pittsburgh district fur.	15.00
Pittsburgh, delivered	15.63 to 16.13

CHARCOAL

Lake Superior, del. Chicago	23.04

SILVERY

Jackson County, O., fur. in per cents: 6—$18; 7—$18.50; 8—$18.75; 9—$19; 10—$19.50; 11—$20; 12—$20.50; 13—$21.50; 14—$22.50; 15—$23; 16—$24; 17—$25.50.

Pittsburgh and Buffalo furnace: 7 to 10—$19.50; 15—$23 to $24.

BESSEMER FERROSILICON

Jackson County, O., fur., in per cents: 10—$20.50; 11—$21; 12—$21.50; 13—$22.50; 14—$23.50; 15—$24; 16—$25; 17—$26.50.

Coke

Prices Per Net Ton

Beehive Ovens

Connellsville furnace	$2.15 to 2.25
Connellsville foundry	3.00 to 4.25
New River foundry	6.00
Wise county foundry	4.25 to 5.00
Wise county furnace	3.50 to 4.25

By-Product Foundry

Newark, N. J., del.	8.21 to 8.81
Chicago, ovens	7.00
New England, del.	10.00
St. Louis, del.	8.50
Birmingham, ovens	4.50
Indianapolis, del.	8.25
Ashland, Ky., ovens, Connell., basis	5.50
Portsmouth, O., ovens Connell., basis	5.50
Buffalo, ovens	7.50 to 8.00
Detroit, ovens	8.00
Philadelphia, del.	8.50

Iron Ore

LAKE SUPERIOR ORE

Gross ton, 51½%, Lower Lake Ports

Old range bessemer	$4.80
Mesabi bessemer	4.65
Old range nonbessemer	4.65
Mesabi nonbessemer	4.50
High phosphorus	4.40

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 56-63%, contract	7.50
Copper-free low phos. 58-65%	nom.

FOREIGN ORE

Cents per units, alongside docks Atlantic ports

Foreign manganiferous ore, 45-55% iron, 6-10% man.	8.50 to 9.00
North African low phos.	7.50 to 8.50
Swedish basic, 65%	7.50 to 8.00
Swedish low phos.	9.00
Spanish, North African basic, 50 to 60%	7.00 to 8.00
Newfoundland fdy., 55%	8.00
Tungsten, spot, short ton unit, duty paid	$10.25 to 10.50
Chrome ore, 48% gross ton c.i.f.	$17.00 to 18.00

Manganese Ore

Prices, not including duty, are cents per unit; cargo lots.

Caucasian, 52-55% (nom.)	24 cents
South African, 52%	22 to 23 cents
South African, 49-51%	21 to 22 cents
South African, 44-47%	20 to 21 cents
Indian, 48-50% (nom.)	22 cents
Brazilian, 46-48% (nom.)	18 cents

Refractories

FIRE CLAY BRICK

Per 1000 f.o.b. Works

First Quality

Pennsylvania, Ohio, Illinois, Kentucky, Maryland, Georgia, Alabama	$35.00
Missouri	35.00

Second Quality

Pennsylvania, Ohio, Illinois, Kentucky, Missouri, Maryland	25.00 to 30.00
Georgia, Alabama	30.00

SILICA BRICK

Pennsylvania	$35.00
Joliet, Ill., East Chicago, Ind.	47.00
Birmingham, Ala.	50.00

MAGNESITE BRICK

Per Net Ton

9 x 4½ x 2½	$61.50

CHROME BRICK

Per Net Ton

F.o.b. shipping point	$42.50

MAGNESITE

Dead burned grain, net ton, Chester, Pa., or Baltimore bases	38.00
Domes, Chewelah, Wash., base	20.90

Semifinished Steel

Prices Per Gross Ton

BILLETS AND BLOOMS

4 x 4-inch base

Pittsburgh, open-hearth	$26.00
Pittsburgh, bessemer	26.00
Youngstown	26.00
Cleveland	26.00
Philadelphia	32.75
Chicago	28.00
Forging, Chicago	34.00 to 35.00
Forging, Pittsburgh	33.00
Forging, Philadelphia	38.75 to 39.75

SHEET BARS

Pittsburgh	26.00
Youngstown	26.00
Cleveland	26.00
Chicago	28.00

SLABS

Pittsburgh	26.00
Youngstown	26.00
Cleveland	26.00

WIRE RODS

Pittsburgh, Cleveland	$37.00
Chicago	36.00 to 38.00

SKELP

All grades, Pittsburgh	1.50c to 1.60c

Ferroalloys

(In dollars, except Ferrochrome)

•Ferromanganese, 78-82%, tidewater, duty paid	$75.00
•Ferromanganese, del. Pittsburgh	80.24
Spiegeleisen, 19-20%, domestic, spot†	27.00
Ferrosilicon, 50 per cent, freight c. l.	77.50
Do, less carload	85.00
Do, 75 per cent	126.00 to 136.00
Silicomang., 2½% carb.	105.00
2% carbon	110.00
1% carbon	115.00
(Spot prices, $5 a ton higher.)	
Ferrochrome, 60-70 chromium, 4-6 carbon, cts. lb. con. del.	10.00
Do, for spot delivery	10.50
Ferrotungsten, stand., lb. cont.	1.00 to 1.10
Ferrovanadium, 30-40 per cent, per lb. contained, on analysis	3.05 to 3.30
Ferrotitanium, c.l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt., all., lb.	8.50
Do, under 1 ton	9.00
Ferrophosphorus, per ton, carload 17-19 per cent, Rockdale, Tenn., basis; 18%, $2 unitage	68.00
Ferrophosphorus, electrolytic per ton carload, 23-26% f.o.b. Anniston, Ala.; 24%, $4.25 unitage	91.00
Ferromolybdenum, stand. 50-60 per cent. per lb.	0.95
Cal. Molybdate, lb. cont.	0.80
Molybdate, lb. cont.	.80

†Carloads. Differentials apply to quant.
•To users of carloads to 1000 tons annually. Differentials to large users.

Fluorspar

85 and 5 per cent grade

Washed gravel, domes., net ton, del. Pitts. equiv.	$20.31
Washed gravel, import duty paid tide. gross ton	19.50

Pig Iron

Eastern Pennsylvania Prices Down 50 Cents—Pittsburgh Basic Easier—Sales Are Light

PIG IRON PRICES, PAGE 50

Pittsburgh—Pig iron demand is closing a month somewhat under the April rate, and the lightest for any month of 1932. Foundries in many instances are either closed or working on curtailed schedule. The merchant furnace in this district has resumed blast after being down several weeks. Prices of $15.50 for No. 2 foundry, malleable and bessemer, are largely nominal. Basic is now quoted at $14.50 to $15, Pittsburgh district furnace, and $15.13 to $16.13, delivered, Pittsburgh. It is reported that the inquiry for bessemer iron for a district pipemaker still is open.

Boston—Pig iron buying and inquiry is at a low point, a few hundred tons in small lots moving during the week, mainly by truck from the local foundry at $16.50, minimum, or from stocks of foreign iron to points nearby storage. Foundry stocks are light, but at present rate of operations ample in many instances for months. Foreign iron is moving slowly, despite attractive prices. Some Indian iron is available at $16 dock.

New York—Pig iron sales here again total under 1000 tons, with Buffalo iron at $14.50, furnace, in carlots, and less for larger quantities. Weakness also is noted in eastern Pennsylvania iron, with $14, furnace, the usual price on car lots. Inquiry totals about 1000 tons.

Philadelphia—On exceedingly light trading, eastern Pennsylvania foundry iron prices have eased off to $13.50 to $14, furnace. Persistent reports of even lower prices on European iron are a contributing factor. With the foundry melt at the lowest point so far, buying is comprised almost entirely of carlots. Of the 7000 tons of Royal Dutch iron which arrived at this port a fortnight ago, it now appears the bulk went to a Delaware river pipemaker. Of the remainder, approximately 1000 tons went into storage. No further shipments from Holland are expected here until fall.

Buffalo—Gradual improvement is noted in the pig iron melt. Eastern seaboard sales continue to be dominated by foreign iron. It now seems probable that little barge iron will be shipped from here this season.

Youngstown, O.—The recent price cut of 50 cents a ton on all grades of valley pig iron has not stimulated demand. Sales and shipments are limited to the usual small lots. No important inquiries are pending.

Cleveland—The May volume of pig iron sales and shipments by furnaces interests with headquarters here will exceed those for April—by a slight margin for those makers whose markets lie chiefly in Cleveland and vicinity, and by a more substantial figure for those lake furnaces selling in the western Ohio, northern Indiana and lower Michigan territory mainly to the automotive industry. The effect of the recent 50-cent per ton reduction in valley pig iron prices, in competition with Cleveland makers in nearby areas, is not yet in evidence as there has been little on which to bid. For local delivery the price remains $15.50, base, furnace.

Cincinnati—A few sales of pig iron in carload lots were reported during the past week, with demand at a low point for the year. Shipments are light, inquiries for small tonnages only.

Chicago—Pig iron shipments continue to record a slight gain over April, and a moderate increase in inquiry lends a better aspect to the market. Orders are in unchanged volume but pending tonnage is heavier than for some time past. Malleable foundries are more active, largely as a result of automotive work, while producers of gray iron castings are running at a slow and unchanged rate. Prices show a stronger tone and the $16 base price is well observed on current small lots of No. 2 foundry and malleable irons.

St. Louis—Activity in the pig iron market remains at a low ebb, new buying so far this month having been smaller than in any similar period since the beginning of the depression. A few scattered inquiries are noted for third quarter, but the majority of users indicate they will continue to buy only when required.

Birmingham, Ala.—Pig iron sales are limited to occasional carload lots. Prices hold at $11, base, furnace, for southern delivery, and $10 for shipment to competitive points in northern territory.

Toronto, Ont.—Merchant pig iron sales show a sharp contraction, the total for the week falling to slightly below 300 tons. Foundry operations are unchanged, but melters report new business is slackening, and it is likely that operations will be further reduced.

Ferrophosphorus Prices Adjusted; Market Quiet

Ferroalloy Prices, Page 50

Birmingham, Ala.—Another adjustment in ferrophosphorus makes the price $68 per gross ton, Rockdale, Tenn., basis, for 17-19 per cent material, this price applying on 18 per cent with $2 unitage. On 23-26 per cent material the new price is $91 per gross ton, f.o.b. cars Anniston, Ala., this price applying to 24 per cent with a unitage of $4.25.

New York—Demand for ferroalloys is slightly less active. No indications of seasonal improvement have appeared. The volume of business in May has been about equal to that of April. The Vanadium Corp. of America, New York, plans to close temporarily the plant of the Southern Mineral Products Co., Piney River, Va., about June 1.

Pittsburgh—Ferroalloy demand from district steelmakers continues small. Inquiry still is noticeably lacking, with the market unchanged at $27, furnace, on spiegeleisen and $75 for ferromanganese.

Chicago—Activity in ferroalloys consists almost entirely of shipments on contracts, with practically no spot buying. Shipments are fairly steady but the movement of ferromanganese and spiegeleisen continues near the lowest level of the year. Prices on small lots continue $75, duty paid, for ferromanganese, and $27, furnace, on 19 and 21 per cent spiegeleisen.

Refractories Prices Down On Fire Clay and Silica

Refractories Prices, Page 50

Pittsburgh—Effective immediately, first quality fire clay brick and silica brick has been reduced $3 per 1000 to $35. The reduction has not affected magnesite or chrome brick, which remain at $61.50 and $42.50, respectively. Second quality fire clay brick likewise has not been affected.

Bituminous coal supplies of industry in the United States averaged 34 days on April 1, according to the National Association of Purchasing Agents, New York. By-product coke plants had a 38-day supply, steel works 42, railroads 28, coal gas plants 55, electric utilities 53.

Scrap

Dullness Continues and Some Prices Drop Slightly—Heavy Accumulations Are a Burden

Chicago—Iron and steel scrap is dull and unchanged. Mill consumption is steady but no new buying has developed and quotations are nominally unchanged. Heavy melting steel continues $6 to $6.50. Forced sales of small lots continue to bring concessions, but large tonnages are not available at such figures. A cargo of blast furnace scrap left Chicago by water late last week for the East.

Boston—Consumers of scrap in New England are taking little tonnage, some important melters being out of the market entirely. No. 1 heavy melting steel is dull, with the Worcester consumer offering $5 delivered and $3.75 for bundled skeleton. Brokers are offering $4 to $4.25 for textile, outside shipment.

Iron and Steel Scrap Prices

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	6.50 to 7.00
Boston, dealers	3.35 to 3.75
Buffalo, No. 1	7.00 to 7.25
Buffalo, No. 2	5.50
Chicago	6.00 to 6.50
Cleve., No. 1	6.75 to 7.00
Cleve., No. 2	6.50 to 6.75
Det., No. 1 deal.	5.00 to 5.50
Det., No. 2 deal.	3.00 to 3.50
E. Pa. del. mill	6.00 to 6.50
N. Y. deal, R. R.	4.00 to 4.50
N. Y. deal, No. 2	2.00 to 2.50
N. Y. deal. yd.	2.50 to 3.00
Pitts. No. 1	9.00 to 10.00
St. L. No. 1 sel.	6.75 to 7.25
Federal, Ill.	6.50 to 7.00
Granite City, Ill.	6.00 to 6.50
Valleys, No. 1	9.25 to 9.75

COMPRESSED SHEETS

Buffalo, dealers	5.50
Chi. (Factory)	5.25 to 5.50
Cleveland	6.75 to 7.00
Detroit, dealers	5.00 to 5.50
E. Pa. new mat.	5.00 to 5.50
Pittsburgh	8.75 to 9.25
Valleys	8.75 to 9.25

BUNDLED SHEETS

Buffalo	4.00 to 4.50
Cinci., deal.	5.00 to 5.50
Cleveland	6.00 to 6.50
Eastern, Pa.	5.00
Pittsburgh	8.00 to 8.50
St. Louis	1.50 to 2.00

SHEET CLIPPINGS LOOSE

Chicago	3.00 to 3.50
Cincinnati	2.50 to 3.00
Detroit, dealers	2.50 to 3.00
St. Louis	1.50 to 2.00

STEEL RAILS SHORT

Birmingham	11.00 to 11.50
Boston, dealers	4.25 to 4.75
Buffalo	10.00 to 10.50
Chicago (3 ft.)	7.50 to 8.00
Chicago (2 ft.)	8.25 to 8.75
Cinci., deal.	9.50 to 10.00
Detroit, deal.	8.00 to 9.00
Pitts. (open-hearth, 3 ft. and less)	10.50 to 11.00
St. Louis	11.00 to 11.50

STOVE PLATE

Birmingham	6.00 to 6.50
Boston, con.	4.50 to 5.00
Buffalo	7.00 to 7.25
Chicago, net	5.00 to 5.50
Cinci., deal. net	3.25 to 3.75
Det., net deal.	2.50 to 3.00
Eastern, Pa.	6.00 to 6.50
N. Y., deal. mill	2.50 to 3.00
St. Louis	6.00 to 6.50

COUPLERS, SPRINGS

Buffalo	9.50 to 10.00
Chicago	7.00 to 7.50
Eastern Pa.	7.50 to 8.00
Pittsburgh	9.75 to 10.25
St. Louis	8.00 to 8.50

ANGLE BARS—STEEL

Chicago	7.00 to 7.50
St. Louis	7.00 to 7.50

LOW PHOSPHORUS

Buffalo, billets and bloom crops	9.00 to 9.50
Cleveland bil. and bloom crops	9.00 to 10.00
Eastern Pa.	9.00 to 10.00
Pittsburgh billet bloom crops	13.00 to 13.50
Pitts., sheet bar crops	11.50 to 12.00

FROGS, SWITCHES

Chicago	6.00 to 6.50
St. Louis	7.00 to 7.50

SHOVELING STEEL

Chicago	6.00 to 6.50
Cleveland	6.25 to 6.50
St. Louis	6.50 to 7.00

RAILROAD WROUGHT

Birmingham	6.00 to 7.00
Boston, dealers	6.50 to 7.00
Buffalo, No. 1	4.75 to 5.25
Buffalo, No. 2	7.00 to 7.25
Chicago, No. 1	5.25 to 5.90
Chicago, No. 2	6.00 to 6.50
Cinci., No. 2	5.50 to 6.00
Eastern, Pa.	7.50 to 8.00
N. Y., No. 1, deal.	5.00 to 5.50
Pitts., No. 2	9.00 to 10.00
St. Louis, No. 1	4.50 to 5.00
St. Louis, No. 2	6.50 to 7.00

SPECIFICATION PIPE

Boston	4.00 to 4.25
Eastern Pa.	8.00 to 8.50
N. Y., deal	5.00 to 5.50

BUSHELING

Buffalo, No. 1	5.50
Chicago, No. 1	4.50 to 5.00
Cinn., No. 1 dl.	4.50 to 5.00
Cinn., No. 2	3.00 to 3.50
Cleve., No. 2	4.00 to 4.25
Det., No. 1 new deal.	4.00 to 4.50
St. L., No. 1	3.50 to 4.00
Val. new No. 1	8.25 to 8.75

MACHINE TURNINGS

Birmingham	3.50 to 4.00
Boston, dealers	1.05 to 1.55
Buffalo	4.50 to 4.75
Chicago	3.00 to 3.50
Cin., deal	3.25 to 3.75
Cleveland	3.50 to 4.00
Detroit	2.00 to 2.50
Eastern, Pa.	3.50 to 4.00
N. Y., deal	1.35 to 1.50
Pittsburgh	6.00
St. Louis	1.50 to 2.00
Valleys	6.50 to 7.00

BORINGS AND TURNINGS For Blast Furnace Use

Boston, dealers	.60 to .75
Buffalo	4.75 to 5.25
Cinn., deal.	3.25 to 3.75
Cleveland	4.00 to 4.50
Detroit, deal.	3.00 to 3.50
Eastern Pa.	3.00 to 3.50
N. Y., deal	1.35 to 1.50
Pittsburgh	6.50 to 7.00

CAST IRON BORINGS

Birming., chem.	12.50 to 13.00
Birming., plain	3.50 to 4.00
Boston, chem.	5.50 to 6.50
Boston, dealers	1.00 to 1.25
Buffalo	4.75 to 5.25
Chicago	3.50 to 3.75
Cinn., deal.	3.25 to 3.75
Cleveland	4.00 to 4.50
Detroit, deal.	3.00 to 3.50
Eastern Pa.	3.00 to 3.50
E. Pa., chem.	8.00 to 10.50
N. Y., deal.	1.50 to 2.00
Pittsburgh	6.50 to 7.00
St. Louis	4.00 to 4.50

PIPE AND FLUES

Cinn., deal.	3.50 to 4.00

RAILROAD GRATE BARS

Buffalo	4.75 to 5.25
Chicago, net	5.00 to 5.50
Cincinnati	4.25 to 4.75
Eastern Pa.	6.00 to 6.50
N. Y., deal.	4.00 to 4.50
St. Louis	5.25 to 5.75

FORGE FLASHINGS

Boston, dealers	3.00 to 3.50
Buffalo	4.50 to 5.00
Cleve. ov. 10 in.	7.00 to 7.50
Detroit	3.50 to 4.00

FORGE SCRAP

Boston, dealers	2.00 to 2.25
Chicago	8.50 to 9.00
Eastern Pa., del.	5.00 to 5.50

ARCH BARS, TRANSOMS

Chicago, net	5.50 to 6.00
St. Louis	6.50 to 7.00

AXLE TURNINGS

Boston, deal.	6.75 to 7.00
Buffalo	6.50 to 7.00
Chi., steelworks	5.00 to 5.50
Cleveland	6.50 to 6.75
Eastern Pa., del.	6.00
Pittsburgh, O. H.	7.50 to 8.00
St. Louis	5.00 to 5.50

STEEL CAR AXLES

Birmingham	10.50 to 11.00
Boston, ship. pt.	8.25 to 8.75
Buffalo	10.00 to 10.50
Chicago	10.00 to 10.65
Eastern Pa.	14.50 to 15.00
St. Louis	10.50 to 11.00

SHAFTING

Boston, ship, pt.	8.50 to 9.00
Chicago	6.75 to 7.30
N. Y., deal.	9.00 to 9.50
St. Louis	8.50 to 9.00
E. Penna.	13.00 to 14.00

CAR WHEELS

Birming. iron	8.00 to 8.50
Boston, iron	10.00 to 11.00
Buffalo, iron	8.00 to 8.50
Buffalo, steel	8.50 to 9.00
Chicago, iron	6.25 to 6.75
Chi., rolled steel	6.75 to 7.25
Cincinnati iron	7.50 to 8.00
E. Pa. steel	7.50 to 8.00
E. Pa. iron	9.00 to 9.50
Pitts. iron	9.50 to 10.00
Pitts., steel	9.75 to 10.25
St. Louis, iron	6.00 to 6.50
St. Louis, steel	6.50 to 7.00

NO. 1 CAST SCRAP

Birmingham	7.00 to 8.00
Buffalo (Mach.)	9.00 to 9.50
Buffalo, cupola	8.00 to 8.50
Boston, textile	7.50 to 8.00
Chicago, mach.	6.70 to 7.25
Chi., railroad	6.15 to 6.70
Chicago, agri.	5.85 to 6.45
Cinn., mach. cup.	7.50 to 8.00
Cleve. cupola	7.00 to 7.50
Det., net deal.	7.00 to 7.50
E. Pa. cupola	9.00
N. Y. cup. deal.	6.50 to 7.00
N. Y., del. local foundries	11.00
Pitts., cupola	9.00 to 9.50
San Fran., del.	13.50 to 14.00
Seattle	5.00 to 7.50
St. L. No. 1 ma.	7.00 to 7.50
St. L., No. 1	6.50 to 7.00

HEAVY CAST

Boston, del.	3.50 to 4.00
Bost., mach. cast	7.50 to 8.00
Buffalo, break	5.50 to 6.00
Cleve., break	3.50 to 4.00
Detroit, auto, net deal.	9.00 to 9.50
Det., break., dl.	4.00 to 4.50
Eastern Pa.	8.00 to 8.50
N. Y. No. 1 dl.	4.00 to 4.50
N. Y. break, dl.	4.50 to 4.75
Pittsburgh	8.00 to 8.50

MALLEABLE

Boston Consum.	8.00 to 8.50
Buffalo	8.00 to 8.50
Chicago, agri.	5.50 to 6.00
Chicago, R. R.	6.50 to 7.00
Cinci., R. R. del.	8.00 to 8.50
Cinci., agri. del.	7.75 to 8.25
Cleveland, rail	7.50 to 8.00
Det. auto deal.	7.00 to 8.00
St. Louis, rail	5.50 to 6.00

RAILS FOR ROLLING 5 feet and over

Birmingham	9.00 to 9.50
Boston, deal.	5.50 to 6.00
Buffalo	7.00 to 7.50
Chicago	8.00 to 8.50
Eastern Pa.	9.50
New York	5.25 to 5.75
St. Louis	9.00 to 9.50

LOCOMOTIVE TIRES

Chicago, cut	7.50 to 8.00
St. L., No. 1	8.00 to 8.50

LOW PHOS. PUNCHINGS

Chicago	8.00 to 8.50
Buffalo	9.00 to 9.50
Eastern Pa.	9.50 to 10.00
Pittsburgh	10.50 to 11.00

About 500 tons has been shipped from Rhode Island to the Delaware river district by barge.

New York—While a small volume of cast scrap is moving to eastern pipe foundries at $8 to $8.50 delivered, scrap demand is dull with several leading consumers out of the market. Prices on most grades are nominal. Movement of No. 1 steel to the Buffalo district is lacking, although some blast furnace borings are being bought for barge shipment to that district.

Philadelphia—On offers of $6.50, delivered, by the leading Coatesville, Pa., consumer, No. 1 heavy melting steel has been marked down to $6 to $6.50, delivered, from $6 to $7. Cast wheels have been reduced nominally 50 cents a ton, to $9 to $9.50, delivered. While there is little business to afford a test, increasing underlying strength is seen in the suspension or partial suspension of operations at scrap yards in this district. Of approximately 12 yards in the immediate territory, not including those in Camden, N. J., Wilmington, Del., and certain other nearby points, at least four have been closed down indefinitely, it is said, and in all other cases bare skeleton organizations are being employed. Unless dealers can show an immediate turnover, banks refuse to lend money for the purchase of stocks for storage; hence, speculative buying by these interests is virtually stopped, although in some grades prices have reached the point where they offer an excellent speculation, it is believed.

Buffalo—Releases have been received from steelworks permitting the first shipments in many weeks. No. 2 heavy melting steel is the principal material being moved. Contracts being completed place the value of this steel at $7 to $7.50, or more than the last previous bid for No. 1 heavy melting steel for delivery here. Some No. 1 machinery cast has been sold at $9 to $9.50, and there also is a little inquiry for heavy breakable cast.

Pittsburgh—The past week lacked the feature of any large mill buying and aside from a small sale of blast furnace borings and turnings there has been little activity. Prices in the main are nominally unchanged. Short steel rails are easier as are couplers, springs and steel car wheels. Borings and turnings for blast furnace use have been marked up nominally by 50 cents a ton on the prior mentioned sale.

Pennsylvania railroad is closing June 1 on 6550 tons of No. 1 heavy melting steel, 4750 tons of iron car wheels, 2875 tons of uncut structural steel scrap, 2500 tons of scrap rails. The total list involves 27,700 tons.

Detroit—Lose sheet clippings are off 50 cents, and machine shop turnings, cast borings and mixed borings and turnings are down 25 cents. Less distress scrap is coming out, which is providing some needed support for prices. The market continues extremely dull, with no immediate change in either offerings or demand in prospect.

Cincinnati—Quotations on iron and steel scrap have sagged in reflection of light demand and, in some grades, considerable accumulation. Little business is reported, except shipments on old contracts, which are held to a minimum. Heavy melting steel is off $1 for a quotation of $5.50 to $6 with other grades also quoted lower.

Cleveland—Steel and iron scrap continues dull but indications are that some buying of heavier steel grades may be done within a fortnight.

St. Louis—No change has developed in the general aspect of the iron and steel scrap market, sales and shipments continuing at a minimum. Despite liberal offerings and scant demand for heavy melting steel, dealers' quotations remain unchanged. Prices lack a real test and are largely nominal. Yard stocks show little variation from April. Dealers are not buying to lay down material and only a few cars of distress material are going into storage.

Birmingham, Ala.—There is practically no market for steel and iron scrap, the smallest amount noted in years now moving. All prices are low and weak.

Toronto, Ont.—New business is practically at a standstill in iron and steel scrap. No. 1 machinery cast is the only live grade and sales are being made in small tonnages. Dealers are out of the market and have made no revision in prices.

Canadian Scrap

Dealers' Buying Prices

Per Gross Ton

MONTREAL

Iron axles	$11.00
Steel axles	10.00
Car wheels	8.00
Stove plate	8.00
Wrought pipe	2.00
Turnings	2.00
Heavy melting steel	6.00

TORONTO

Steel axles	7.00
Iron axles	7.00
Heavy melting steel	7.00
Turnings	2.00
No. 1 mach. cast (net)	9.00
Malleable (net)	7.00

Link-Belt Co., Chicago, reports consolidated net loss of $174,809 for the first quarter, against net loss for the similar 1931 period of $252,631. Sales were $1,812,759 against $3,653,766.

Coke

Demand for Furnace and Foundry Grades Continues at Low Ebb, with Prices Steady

COKE PRICES, PAGE 50

Pittsburgh—Coke makers are experiencing an extremely dull market and see little to change in the immediate future. Prices of $2 to $2.25 for furnace coke, and $3 to $4.25, depending on grade, for foundry coke, remain unchanged.

New York—Standard grades of beehive furnace coke are available at $2 to $2.25, Connellsville; standard grades of beehive foundry coke at $3 to $3.25, Connellsville, and premium brands of foundry at $4 to $4.50, Latrobe, Pa. By-product foundry coke is $8.21 to $8.81, delivered, Newark, N. J.; $10, New England; and $8.50, Philadelphia.

Cincinnati—Demand for by-product foundry coke has not improved, shipments reflecting the low melt in this district. Quotations are unchanged.

St. Louis—Shipments of by-product foundry coke continue at a low rate, and according to the leading interests here May will be the lightest month so far this year. Contracts are expected to be placed early in June, but indications are that the volume will be the smallest in recent years.

Birmingham, Ala.—Orders for coke continue small. Production proceeds at less than 50 per cent.

Electrical Engineers Equipment Co., Twenty-fifth and Division streets, Melrose Park, Ill., has increased its capital from $500,000 to $750,000.

Nonferrous Mill Products

Base price cents per pound f.o.b. mill except otherwise specified. Copper and brass product prices based on 5.75c, Conn., for copper

Sheets	
Yellow brass (high)	12.00
Copper, hot rolled	15.12½
Lead sheets, cut, to jobbers	6.50
Zinc sheet (100-lb. base)	9 00
Tubes and Pipes	
Seamless yellow brass (high)	15.25
Seamless copper	14.37½
Rods	
Yellow brass (high, full turnings)	9.75
Naval brass	10.87½
Anodes	
Copper untrimmed	11.75
Wire	
Yellow brass (high)	12.00

Old Metals

Dealers' buying prices, cents lb.

No. 1 Composition Red Brass	
New York	2.75 to 2.87½
Chicago	2.00 to 2.25
Cleveland	2.25 to 2.50
St. Louis	2.75
Heavy Yellow Brass	
New York	1.75 to 1.87½
Heavy Copper and Wire	
New York	3.62½ to 3.87½
Chicago	2.62½ to 2.87½
Cleveland	2.25 to 2.75
St. Louis	3.00
Composition Brass Borings	
New York	2.25 to 2.50
Yellow Brass Tubing	
Cleveland	1.25 to 1.50
Light Copper	
New York	2.75 to 3.00
Chicago	2.12½ to 2.37½
Cleveland	2.00 to 2.25
St. Louis	2.75
Light Brass	
Chicago	1.12½ to 1.25
Cleveland	1.00 to 1.25
St. Louis	1.50
Lead	
St. Louis	2.00
Zinc	
New York	0.75 to 1.00
Cleveland	0.62½ to 0.87½
St. Louis	1.00
Aluminum	
Clippings, new, soft, Cleve.	9.00 to 9.50
Clippings, hard, Cleveland	6.50 to 7.00
Borings, Cleveland	2.50 to 3.00
Mixed cast, Cleveland	3.00 to 3.50
Mixed cast, St. Louis	3.00 to 3.50

Secondary Metals

Remelt, aluminum No. 12	8.00 to 9.00
Brass ingots, 85-5-5-5	6.00

Metals

Rapid Advance in Zinc Prices Accompanied by Strengthening In Copper—Lead Holds Steady

New York—A rapid rise in zinc quotations and a slightly firmer tone in the copper market featured the metals last week. Lead, aluminum, nickel and antimony prices remained unchanged during the period. Sales of all metals still were restricted.

Copper—After easing to the record low price of 5.25c, Connecticut, copper firmed last week following the passage of an import duty of 4 cents a pound by the senate. At the close of the week, custom smelters generally were asking 5.37½c. Producers remained out of the market at the nominal quotation of 5.75c to 6.00c. Copper and brass product prices remained unchanged following the recent decline. Brass ingots also were steady but scrap tended downward.

Lead—Demand generally was moderate with some improvement noted toward the close of the period, particularly in the Midwest. June requirements were reported to be only about 50 per cent covered so sellers anticipated fair sales in the near future.

Zinc—Reports that Tri-State ore producers might shutdown for about two months this summer and plans for further curtailment of smelter activity brought a rise of more than a half-cent in prices from the low of 2.30c, East St. Louis, touched May 16 and 17. The advance lost momentum late in the week, however, but most of the gains were held.

Tin—Domestic interest in Straits tin generally was lacking. Prices fluctuated somewhat with the changes on the London exchange but, on the whole, were fairly steady.

Aluminum—The market was only moderately active but prices continued to hold.

Antimony—Prices held steady but demand was dull.

Quicksilver Easier

New York—Quicksilver prices are lower this week, small lots being quoted $65 to $66 a virgin flask, of 76 pounds, for prompt delivery. Sellers indicate lots of 25 to 50 flasks might be had at $1 under the small-lot prices.

Sulphate Prices Easier; Distillates Steady

New York — Light production, rather than demand, tends to keep distillate prices steady. Current output goes directly into consumption.

Coke By-Products

Per Gallon, Producers' Plants, Tank Lots

	Spot
Pure benzol	$0.20
90 per cent benzol	0.20
Toluol	0.30
Solvent naphtha	0.26
Commercial xylol	0.26

Per Pound at Producers' Plants in 250-Pound Drums

Phenol	0.153 to 0.173

Per Pound at Producers' Plants in

Naphthalene flakes	3.75 to 4.75
Naphthalene balls	4.75 to 5.75

Per 100 Pounds Atlantic Seaboard

Sulphate of ammonia	$1.00

Toluol and benzol buying is light. Naphthalene shipments are fairly active at unchanged prices. Sulphate of ammonia is easy with $20 a ton, Atlantic seaboard, quoted for domestic material.

Production of artificial diamonds large enough for abrasive purposes at $5 a carat is claimed by Prof. Ralph H. McKee, of Columbia university, and L. H. Barnett, working under the laboratory direction of Professor McKee. The pressure of steel molds, cooling, upon an inclosure of iron containing carbon, silicon and phosphorus is the method.

Nonferrous Metal Prices of the Week, Cents a Pound

	Copper—— Electro delivered	Lake delivered	Casting refinery	Straits Tin New York Spot	Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 98-99%	Antimony Spot	Antimony Ingot	Nickel
May 21	5.25	5.87½	5.00	21.12½	21.45	3.00	2.90	2.45	22.90	5.12½	35.00	
May 23	5.25	5.87½	5.00	20.87½	21.20	3.00	2.90	2.50	22.90	5.12½	35.00	
May 24	5.25	5.87½	5.00	21.10	21.45	3.00	2.90	2.60	22.90	5.12½	35.00	
May 25	5.30	5.87½	5.05	20.87½	21.20	3.00	2.90	2.87½	22.90	5.12½	35.00	
May 26	5.37½	5.87½	5.12½	20.65	20.95	3.00	2.90	2.85	22.90	5.12½	35.00	
May 27	5.37½	5.87½	5.12½	20.60	20.90	3.00	2.90	2.85	22.90	5.12½	35.00	

Pacific Coast

Reinforcing Bars in Better Tonnage—Hydroelectric Work Is Aid—Plate Prices Advanced to Balance Higher Water Freight —Pipe Demand Small but Some Is Being Placed Each Week

San Francisco—*(By Air Mail)*—While several tonnages of structural steel shapes and reinforcing bars have been placed, few new inquiries of importance have come out.

Reinforcing bar awards were the third largest this year, over 2400 tons. An unnamed interest was awarded 1200 tons for the El Capitan dam, San Diego, Calif. The Pacific Coast Steel Corp., booked 291 tons for a cutoff for the Union Pacific railroad, at Long Beach, Calif. S. A. Spear secured 250 tons for the Banning creek dam at Prescott, Ariz. Bids have been opened on 114 tons for a highway in Arizona. Out-of-stock prices in the San Francisco district continue to hold at 2.60c, base, on carload lots. Mild steel bars are in little demand and are quoted, generally at 2.00c, c.i.f.

The plate market is exceptionally quiet and no awards or new inquiries for 100 tons or more, were reported. Prices appear firm now at 1.90c, c.i.f.

McClintic-Marshall Corp. booked 170 tons for a substation in West Hollywood, Calif. Bids have been opened on 500 to 600 tons for a cableway for the Six Companies, Boulder City, Nev., and on 400 tons for a power house for Vernon, Calif. Plain shapes are firm at 2.00c, c.i.f., for standard shapes and at 2.10c for wide flange material.

An unnamed interest has booked 400 tons of cast iron pipe for the El Capitan dam project, San Diego, Calif. Other awards of the week were confined to lots of less than 100 tons. Oakland will open bids soon on 896 tons of 4 to 10-inch pipe, and Glendale on 349 tons of 24-inch. Movement of standard steel pipe is confined to small lots and no new pipe line inquiries of size have come out recently.

Plates Higher on Coast

Seattle—Bayley Hipkins Inc., Seattle, submitted the lowest of three bids for completion of Seattle's Diablo hydroelectric project, at $1,744,705. The work includes powerhouse, tail race, erection of machinery and miscellaneous equipment. The successful contractor will be required to take $1,860,000 in city light bonds. No bid was received for an additional issue of $1,640,000 utility bonds. Decision is pending.

Mill prices of plates have been advanced from 1.85c to 1.90c to absorb the increased water freight rate from the North Atlantic. Other items are unchanged: Standard shapes 2.00c, specials 2.10c, bars 2.00c. While local warehouse prices are unchanged there is indication of an advance soon.

There is little inquiry for cast iron pipe. At Centralia, Wash., on an improvement project involving 340 tons, the city council gave the award to a local firm for concrete pipe, 18 and 20-inch. Seattle has opened bids for a sewer district involving 120 tons of 12 and 16-inch cast iron pipe.

The scrap market continues inactive as both mills are idle and not buying. Japan buyers are offering $8.50 per gross ton, c.i.f., for No. 1 steel scrap but exporting houses are unable to meet this price. For 25 tons of junk copper Seattle received bids ranging from $2 to $4.25 per 100 pounds.

Oregon has awarded highway contracts involving expenditure of $700,000, including a steel bridge over the Santiam river to Odom & Durette, of Salem, Oreg., $103,710.

Steel in Europe

Britain Feels Iron Imports, but Exports Steel

London — *(By Cable)* — British markets are dull following the Whitsun holidays. Low-priced Continental pig iron is reaching South Wales, and Indian pig iron is being unloaded in Scotland. Orders have been received from Russia for 40,000 tons of plates and from Canada for 1000 tons of tramrails. Japan is buying in small lots.

Continental markets are sluggish with French mills competing in Belgium. Germany has taken some orders for steel for the United States and several South American countries.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, May 26

Export Prices f.o.b. Ship at Port of Dispatch—By Cable (or Radio)

	British gross tons U. K. ports		Continental Channel or North Sea ports, metric tons Gold parity, $4.8665	
PIG IRON	£ s d		£ s d	£ s d
Foundry, 2.50-3.00 Silicon	$10.79	2 18 6	$ 8.75 to $ 9.25	1 16 0 to 1 18 0
Basic bessemer	10.33	2 16 0*	9.25	1 18 0
Hematite, Phos. .03-.05	11.81	3 4 0	.....	.....
SEMIFINISHED STEEL				
Billets	$19.83	5 7 6	$9.84	2 0 6
Wire rods, No. 5 gage	27.68	7 10 0	21.87	4 10 0
FINISHED STEEL				
Standard rails	$30.44	8 5 0	$28.55	5 17 6
Merchant bars	1.05c	6 7 6	.48c to .50c	2 4 0 to 2 5 0
Structural shapes	1.22c	7 7 6	.46c to .47c	2 2 0 to 2 3 0
Plates, †¼ in. or 5 mm.	1.44c	8 15 0	.59c to .61c	2 14 0 to 2 15 0
Sheets, black, 24 gage or 0.5 mm.	1.32c	8 0 0	1.20c to 1.21c	5 9 0 to 5 10 0
Sheets, gal., 24 gage, corr.	1.73c	10 10 0	1.51c	6 17 6
Bands and strips	1.32c	8 0 0	.72c to .74c	3 5 0 to 3 7 6
Plain wire, base	1.40c	8 10 0	1.18c	3 5 0 to 3 7 6
Galvanized wire, base	2.04c	12 7 6	1.38c to 1.40c	6 5 6 to 6 7 6
Wire nails, base	1.82c	11 0 0	1.21c	5 10 0
Tin plate, box 108 lbs.	$ 2.77	0 15 0	$3.20	0 13 2

British ferromanganese $72 to $75 delivered Atlantic seaboard, duty paid. German ferromanganese £9 0s 0d ($43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

	£ s d		French Francs		Belgian Francs		Reich Marks	
Fdy. pig iron, Si. 2.5	$10.61	2 17 6	$ 9.09	230(2)	$ 9.10	325	$16.40	69
Basic bessemer pig iron	10.33	2 16 0*	7.90	200(1)	8.26	245	17.92	75.50
Furnace coke	2.44	0 13 3	4.90	124	4.48	160	5.08	21.40
Billets	20.30	5 10 0	14.62	370	10.78	385	23.61	99.50
Standard rails	1.38c	8 7 6	1.41c	785	1.37c	1,210	1.37c	127
Merchant bars	1.09c	6 12 6	.95c	530	.55c	425	1.24c	115
Structural shapes	1.44c	8 15 0	.99c	550	.55c	425	1.22c	112.50
Plates, †¼-in. or 5 mm.	1.46c	8 17 6	1.17c	650	.70c	535	1.43c	132.50
Sheets, black	1.44c	8 15 0‡	1.44c	800‡	.88c	675‡	1.56c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	1.55c	9 7 6	2.70c	1,500	1.78c	1,370	3.40c	370
Plain wire	1.40c	8 10 0	2.03c	1,130	1.95c	1,500	1.92c	178
Bands and strips	1.57c	9 10 0	.92c	510	.88c	675	1.44c	133

*Basic. †British ship-plates, Continental, bridge plates. §24 ga. ‡1 to 3 mm. basis price.
British quotations are for basic open-hearth steel, Continental usually for basic-bessemer steel.

Machinery

Equpment Busness Holds at Low Level—Inquiries Light

New York — Equipment buying and inquiry continues to drag. Sales are confined to a few individual units and no inquiry of size is out, most of the larger eastern plants being out of the market. Production schedules are off sharply, about the only activity being by a number of district plants making equipment for the Rockefeller Center project and these are not buying equipment. General Electric Co. is planning the construction of a new oil burner boiler at Pittsfield, but will equip the plant from Schenectady. There is a wealth of low-priced used machinery on the market.

Worcester—While some spotty improvement in machinery orders is noted with New England tool builders, comparatively few have shared in the volume, and the demand for equipment is generally dull and unchanged. A Providence shop is reported to have booked a substantial automatic screw machine order with the prospects of additional business from the same buyer. Inquiry is light, confined largely to automatic and semiautomatic equipment, little being done in standard machine tools. As reported several weeks ago there has been a moderate increase in foreign business, notably with Russia. Advanced engineering details and refinements in design, difficult to duplicate abroad, were factors in bringing the business to this country. While production schedules have been light, engineering developments have not been neglected by New England machine buildeds.

Pittsburgh—Although orders for heavy as well as light machines still are conspicuously absent a further unfavorable trend is becoming prevalent in the market in that the volume of inquiries the past week or so has declined. Machinery manufacturers and dealers still have a sizable volume of old carryover pending work but finances on the part of prospective buyers are a stumbling block. Machine tool orders from this district's steelmakers still fail to put in an appearance.

Chicago — Orders for machine tools and equipment are unimproved, and the tone of the market continues depressed by the universal lack of interest on the part of leading users in new purchases. Railroads continue out of the market for plant equipment and are making but few purchases for track work.

Cleveland—Occasional reports of slight improvement in machinery and equipment sales are heard, although no definite trend upward is discernible. A number of lathes, milling machines and saws have been placed with builders in this territory for installation at Wright field, Dayton.

Conduct Clinic On Steel House

(*Concluded from Page* 13)

the desirability of fixing the cost of the average family home close to $5000.

G. H. Danforth, contracting engineer, Jones & Laughlin Steel Corp., told of the experiences of that company in small house construction with J & L junior beams in the last six years, and detailed results with two houses erected in 1928 by a speculative builder with highly successful results.

These are 9-room, 2½-story structures with pitch roof, insulated walls, brick exterior and metal lath. Cost of erection was about $10 a ton. Cost of steel frame was approximately 5 cents a pound for one house with one-half cent for erection. He said this was too high, that steel-frame house building must have a price appeal. Since, costs have been reduced and welding, eliminating drawing room and shop costs, both expensive, has been a factor in lower costs.

He described junior beam steel floor construction and advantages, especially first floors, stating the spread in cost as compared with wood floors was not large, being cheaper after the first few years as a result of less servicing after the house had been occupied over that period. Insurance companies are not inclined to make a division in policy rates between steel and wood houses, but in cases where inspections have been made, notably one in Illinois, a $10,000 house with a steel beam flooring the rate was greatly reduced, giving a saving that covered the cost of the junior beam flooring in five years.

Henry Dubin, architect, Chicago, illustrated a steel-frame house with metal windows, roof and battledeck flooring. He made a plea for design especially for steel or machine age housing, stating that too often the steel design was made for the use of the older materials. On this house there is an insurance rate of 11 cents per $100. This building was largely shop fabricated by welding, not more than one-fourth of the welding being done on the site, while large sections of flooring, roof and other units were erected at once by crane—a few minutes after arrival of the truck from the shop.

Steel producers, anxious to develop additional outlets for steel, stand ready to assist the building industry and designers in every consistent manner, according to J. C. Shields, Carnegie Steel Co., who told of the large field offered by the small house, reviewed the progress already made and indicated the willingness of the United States Steel Corp. and other steel producers to co-operate with the building industry in efforts to increase the consumption of steel. The average 6-room frame house takes approximately 7½ tons in the frame alone, additional tonnage averaging 4½ tons per house, covering flooring, exterior or interior, or both, strip and other miscellaneous requirements.

A special committee from various subsidiaries of the United States Steel Corp. has been studying plans and methods of steel-frame house construction and a report will be ready in a few weeks.

Welding Given Attention

Welding, an important detail in house framing, came in for much attention, many speakers contending that in this type of fabrication, welding offers the ideal method for both shop and field work.

Other speakers at the forum meetings included: J. C. Lincoln, the Lincoln Electric Co., Cleveland; P. E. Selby, Steel-Built Homes Inc., Cleveland; Harold P. Mueller, builder, Philadelphia; H. W. Brown, Housing Co., Waverly, Mass.; R. P. Hutchinson, president, Bethlehem Fabricators Inc., Bethlehem, Pa.; H. H. Moss, the Linde Air Products Co., New York; D. E. McEvoy, builder, New York; Frank Burton, consulting engineer, Detroit; Lee H. Miller, chief engineer, American Institute of Steel Construction, Cleveland; T. J. Foster, chairman of board, National Bridge Works, Long Island City, N. Y.; Henry Mandel, builder, New York; Robert Tappan, architect, New York; D. Everett Waid, architect, New York; Ely Jacques Kahn, architect, New York; Andrew J. Thomas, architect, New York; Harvey Wiley Corbett, architect, New York; A. Raymond Ellis, architectural director, *Woman's Home Companion*, New York; Miss Eloise Davidson, National Electric Light association, New York; Mrs. Bernice Bowser, merchandising consultant, Bowser Service Corp., New York; Miss Grace Pennock, *Delineator*, New York; Ralph Bailey, managing editor, *Home and Field*, New York; and J. F. McNamara, the International Nickel Co. Inc., New York.

PROPOSED "SHARON SPECIFICATIONS"

RESULT . . . DEPOSIT TROUBLES WERE OVERCOME . . . AND CORRECT FINISH FOR THE STRIP STEEL WAS GAINED

Many fabricators who maintain their own pickling departments have taken advantage of Sharon's wealth of experience and knowledge of various pickling processes in connection with strip steel. ▼ Just recently a manufacturer, finding troublesome deposits on his strip steel after pickling, brought the matter to the attention of a Sharon representative. After spending the necessary time in the customer's pickling department to study the cause, an improvement of the pickling process was recommended . . . and the deposits were eliminated. ▼ In another case, a specially desired finish on strip steel was gained through Sharon's practical engineering aid—the recommendation of a definite change in the pickling solution. ▼ These are day by day examples that illustrate the interest and aid Sharon extends beyond the manufacturing and supplying of correctly specified, highest quality strip steel. ▼ What is your present strip steel problem? Send for a Sharon representative and experience the thoroughness of "Sharon Specifications" service to help you solve it.

SHARON STEEL HOOP CO., SHARON, PA.

SHARON

Hot and Cold Rolled Strip Steels

"Enamelite" Enameling Iron

"Nevastain" Stainless Steels

Steel Sheets

Steel, Wrought and Cast Iron Pipe, and Tubing

Welded Iron, Steel Pipe

Base Price $200 Ton

Base Discounts on steel pipe, Pittsburgh and Lorain, O., to jobbers in carloads. Indiana Harbor, Ind., and Evanston, Ill., 2 points less. Chicago del., 2½ points less. Wrought pipe, Pittsburgh base.

BUTT WELD

	Steel			Iron	
In.	Blk.	Gal.	In.	Blk.	Gal.
⅛	58	44½	⅛	25	7
¼	62	50½	¼	30	13
1—3	64	52½	1—1¼	33	17
			1½—2	37	20

LAP WELD

2	57	45½	2	25	11
2½—6	61	49½	2½—3½	30	15
7—8	58	45½	4—6	32	19
9—10	56	43½	7—8	31	18
11—12	55	42½	9—12	28	13

BUTT WELD

Extra strong, plain ends

⅛	55	44½	¼ & ⅜	+11	+46
¼	60	49½	½	25	9
1—1½	62	51½	¾	30	14
2—3	63	52½	1—2	36	20

LAP WELD

Extra strong, plain ends

2	55	44½	2	31	15
2½—4	59	48½	2½—4	36	22
4½—6	58	47½	4½—6	35	21
7—8	54	41½	7—8	33	19
9—10	47	34½	9—12	23	10
11—12	46	33½			

To large jobbers these discounts on steel pipe increased on black by 1 point and two discounts of 5 per cent; on galvanized by 1½ points with two 5 per cents. Direct mill shipments, base, 5 and 2½. On iron pipe large jobbers obtain additional discount of 1 point with 5 and 2½ per cent on black and galvanized.

BOILER TUBES

Carload discounts, f.o.b. Pittsburgh

Lap Welded Steel			Charcoal Iron	
2—2¼	38	1¾	8
2½—2¾	46	2—2¼	13
3	52	2½—2¾	16
3¼—3¾	54	3	17
4	57	3¾—3½	18
4½—6	46	4	20
1½	1	4½	21

On lots of a carload or more, above base discounts subject to preferential of two 5 per cent discounts on steel and 10 per cent on charcoal iron. Smaller quantities subject to following modifications from base discounts.

Lap Welded Steel—Under 10,000 pounds, 6 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and two 5 per cents. Charcoal Iron—under 10,000 pounds, 2 points under base; on 10,000 pounds to carload, base and one 5 per cent.

STANDARD COMMERCIAL SEAMLESS BOILER TUBES

COLD DRAWN

1 inch	61	3	46
1¼—1½	53	3¼—3½	48
1¾	37	4	51
2—2¼	32	4½, 5, 6	40
2½—2¾	40		

HOT ROLLED

2—2¼	38	3¼—3½	54
2½—2¾	46	4	57
3	52	4½ 5, 6	46

Subject to 5 per cent supplementary discount for carload lots. On less than 10,000 pounds, base discount reduced 6 points. On 10,000 pounds to carload, base discount reduced 4 points and one 5 per cent allowed. No extra for lengths up to and including 24 feet. Sizes smaller than 1 inch and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Tubing

Cold drawn; f.o.b. mill discounts

Random lengths over 5 ft. 55%
Selected lengths, 1—18 ft. 53%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

Six-inch and over, Bir. ....$32.00 to 33.00
Four-inch, Birmingham .... 36.00 to 37.00
Four-inch, Chicago ..... 38.40 to 42.40
Six to 24-inch, Chicago..... 34.40 to 38.40
Six-inch and over, N. Y..... 28.00 to 30.00
Four-inch, New York ..... 34.50 to 36.50
Stand. fittings, Bir. base.... $100.00

Six to 24-inch, base; over 24-inch plus $20; 4-inch, plus $10; 3-inch plus $20; gas pipe fittings, $5 higher. Class A pipe $4 higher than Class B.

Warehouse Quotations at Leading Centers, in Cents Per Pound

(All Philadelphia prices subject to quantity differentials except reinforcing and Swedish bars)

STEEL BARS

Baltimore	2.75c
Boston	3.25c
Buffalo	3.00c
Chattanooga	3.00c
Chicago	2.75c
Cincinnati	3.00c
Cleveland	2.75c
Detroit	2.85c
Houston	2.65c
Los. Ang.	2.35c
New York‡(d)	3.10c
Philadelphia	2.45c
Pittsburgh	2.60c
Portland	2.75c
San Fran.	2.35c
Seattle	2.75c
St. Louis	3.00c
St. Paul	3.00c
Tulsa	3.25c

IRON BARS

Baltimore	2.75c
Boston	3.25c
Buffalo	3.15c
Chattanooga	3.00c
Chicago	2.75c
Cincinnati	3.00c
Detroit	2.85c
New York‡(d)	3.10c
Philadelphia	2.45c
St. Louis	3.00c
Tulsa	3.25c

REINFORC. BARS

Baltimore	2.35c-3.00c
Boston	3.25c
Buffalo	2.95c
Chattanooga	3.00c
Cincinnati	3.00c
Cleveland	2.10-2.25c
Detroit	2.85c
Houston	3.00c
Los. Ang. cl.	1.90c
Los Ang., lcl	2.20c
New York	2.65c-3.10c
Phila.	2.26½c
Pittsburgh	2.60c
San Fran. cl.	2.60c
San Fran. lcl	2.80c
Seattle	3.00c
St Louis	3.15c
Tulsa	3.25c
Young.	2.30c-2.60c

SHAPES

Baltimore	2.75c
Boston	3.35c
Buffalo	3.25c
Chattanooga	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland	2.95c
Detroit	3.10c
Houston	3.25c
Los. Ang.	2.35c
New York(d)	3.10c
Philadelphia	2.45c
Pittsburgh	2.85c
Portland	2.75c
San Fran.	2.35c
Seattle	2.75c
St. Louis	3.25c
St. Paul	3.25c
Tulsa	3.50c

PLATES

Baltimore	2.75c
Boston	3.35c
Buffalo	3.25c
Chattanooga	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland, ¼-in. and thicker	2.95c
Clev., 3/16-in.	3.20c
Detroit	3.10c
Det., 3/16-in.	3.10c
Houston	3.00c
Los Angeles	2.35c
New York(d)	3.30c
Philadelphia	2.45c
Phila. floor	5.10c
Pittsburgh	2.85c
Portland	2.75c
San Fran.	2.35c
Seattle	2.75c
St. Louis	3.25c
St. Paul	3.25c
Tulsa	3.50c

NO. 10 BLUE

Baltimore	3.25c
Boston	3.50c
Buffalo	3.50c
Chattanooga	3.50c
Chicago	3.20c
Cincinnati	3.30c
Cleveland	3.00c
Detroit	3.35c
Houston	3.35c
Los Ang.	3.50c
N. Y.	3.00c
Portland	3.75c
Phila.*† (e)	2.90c
Pitts.**	3.00c
San Fran.	3.50c
Seattle	3.75c
St. Louis	3.45c
St. Paul	3.45c
Tulsa	3.70c

NO. 24 BLACK

Balt.*†	3.50c
Boston	4.20c
Buffalo	4.10c
Chattanooga	3.65c
Chicago	3.55c
Cincinnati	3.75c
Cleveland	3.25c
Detroit	3.50c
Los Ang.	4.05c
New York	3.75c-4.00c
Phila.*†(e)	3.40c
Pitts.**	3.40c
Portland	4.25c
San Fran.	3.95c
Seattle	4.25c
St. Louis	3.80c
St. Paul	3.695c
Tulsa	4.75c

NO. 24 GAL. SHEETS

Balt.*†	4.00c
Boston	4.75c
Buffalo	4.35c
Chattanooga	3.95c
Chicago	4.10c
Cincinnati	4.25c
Cleveland	3.75c
Detroit	4.00c
Houston	4.25c
Los. Ang.	4.35c
New York	4.00c-4.10c
Phila.*†(e)	3.75c
Pitts.**	3.90c
Portland	4.75c
San Fran.	4.35c
Seattle	4.75c
St. Louis	4.35c
St. Paul	4.19c
Tulsa	5.10c

BANDS

Baltimore	3.25c
Boston	3.75c
Buffalo	3.35c
Chattanooga	3.20c
Chicago	2.95c
Cincinnati	3.20c
Cleveland	3.00c
Det. 3/16-in. & lighter	3.15c
Houston	3.65c
Los Ang.	4.30c
New York(d)	3.40c
Philadelphia	2.75c
Pittsburgh	2.95c
Portland	3.25c
San Fran.	3.75c
Seattle	3.25c
St. Paul	3.20c
Tulsa	3.45c

HOOPS

Baltimore	3.25c
Boston	4.90c-5.40c
Buffalo	3.90c
Chicago	3.50c
Cincinnati	3.75c
Cleveland	3.55c
Det. No. 14 & lighter	3.65c
New York	3.75c
Philadelphia	3.00c
Pittsburgh	3.60c
Seattle	4.75c
St. Paul	3.75c

COLD FIN. STEEL

Rounds & Hexagons

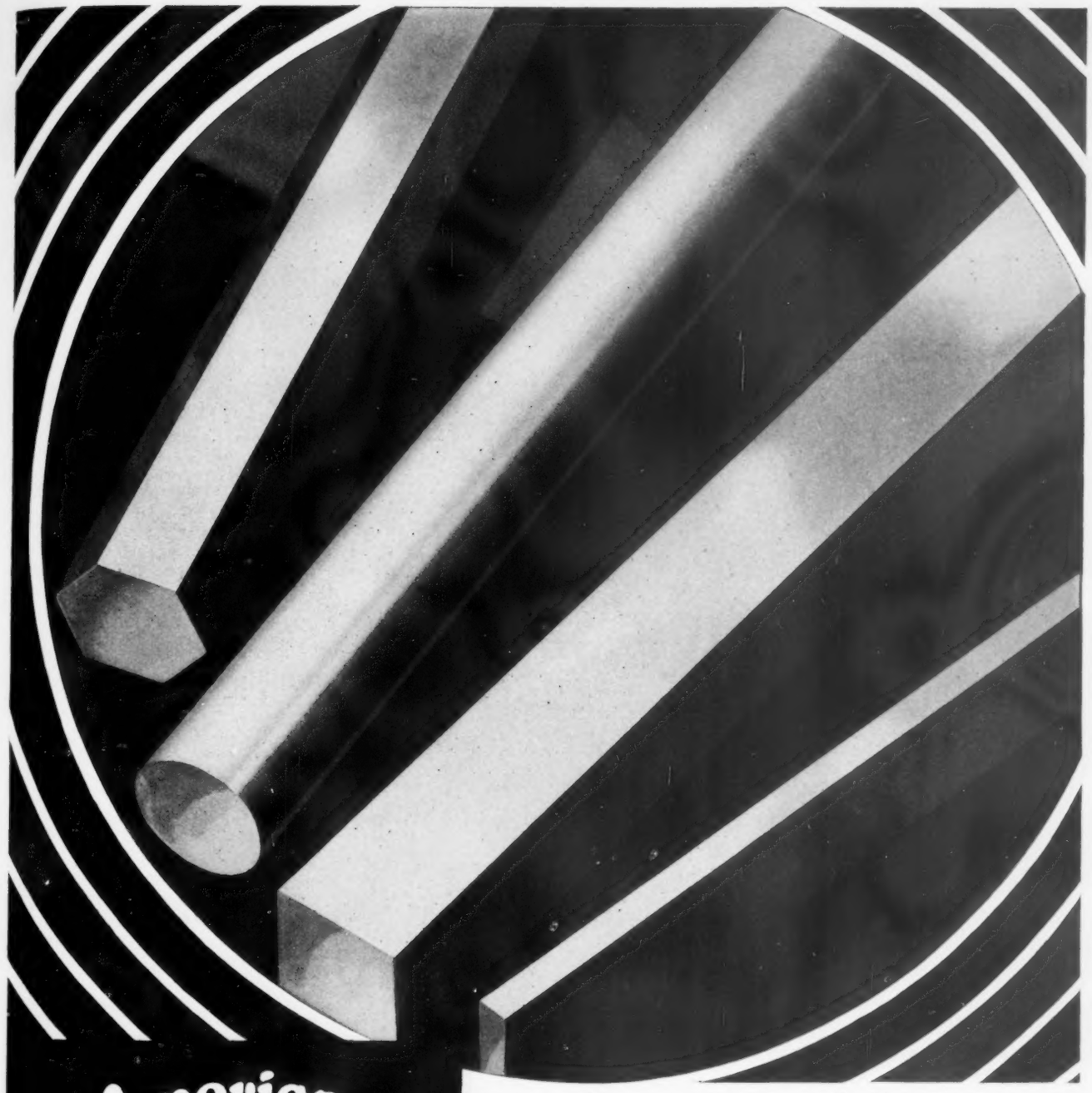
Baltimore (c)	3.30c
Boston	3.50c
Buffalo	3.15c
Chattanooga*	3.75c
Chicago	3.10c
Cincinnati	3.50c
Cleveland	3.10c
Detroit	3.17c
Los Ang. (a)	4.50c
New York	3.30c
Philadelphia*	3.30c
Pittsburgh	2.95c
Portland (a)	4.50c
San Fran.(a)	4.25c
Seattle (a)	4.50c
St. Paul (a)	3.50c
St. Louis	3.35c
Tulsa	4.65c

Flats and squares 50c extra, except Tulsa, where 5.14c is quoted. (a) Rounds, hex. only.

COLD ROLL. STRIP

Boston 0.100 in., 500 lb. lots	5.30c
Buffalo	5.25c
Chicago (soft) (b)	5.65c
Cincinnati	5.80c
Cleve. (b)	5.55c
Detroit	5.40c
Phila. (c)	4.55c
New York	4.55c

(b) Net base straightening, cutting, boxing 1 ton or more.
(c) Plus mill, size and quantity extras.
(d) Minus quant. diff.
(e) New mill classif.
‡Domestic bars.
*Plus quan. extras.
**Less than 25 sheets.
*†50 or more bundles.



American QUALITY Steel & Wire Company

COLD FINISHED STEEL BARS

The "Workability" You Want

The amazing variety of parts that are today made from American Quality Cold Finished Steel Bars in carbon steels and alloys is all the more reason why you should consult our engineers. Some one certain type or grade is sure to meet your needs best and most economically—in machining qualities and cutting speeds. Our extensive facilities for furnishing the best in analysis and drawing bring you every assurance of reliability.

1831 — MORE THAN 100 YEARS of PROGRESS IN WIRE MAKING — 1932

AMERICAN STEEL & WIRE COMPANY

208 South LaSalle Street, Chicago — SUBSIDIARY OF UNITED STATES STEEL CORPORATION — And All Principal Cities

Pacific Coast Distributors. Columbia Steel Company, Russ Building, San Francisco — *Export Distributors:* United States Steel Products Company, New York

Construction and Enterprise

CONCISE, TIMELY BUSINESS BUILDING OPPORTUNITIES IN FIELD OF INDUSTRY

New York

BUFFALO—Aluminum & Metal Products Co. suffered loss of about $6000 by fire in its plant.

New Jersey

BLOOMFIELD—Pioneer Tool Co. Inc. has been incorporated with $30,000 preferred stock and 200 shares common, to manufacture tools, by E. Echikson, Newark.

NEWARK—Flake-Ice Corp., 205 Water street, Brooklyn, N. Y., has leased space at 574 Ferry street, and will equip machine shop and laboratory, to cost 40,000.

NEWARK—Acme Steel Drum Co. Inc. has been incorporated with $50,000 capital to manufacture metal containers, by David Silver, Newark.

NEWARK—Union Wire Frame Co. has been incorporated with $125,000 capital to manufacture hat frames and wire meshes, by Louis Ogust, Newark.

TRENTON—Trenton Stove & Repair Co. Inc. has been incorporated with 1000 shares common stock to manufacture stoves, by J. Conner French, Trenton.

Ohio

PIQUA—Piqua Handle & Mfg. Co., manufacturer of woodworking equipment and novelties, plans to rebuild its burned plant, at cost of $40,000.

Michigan

ANN ARBOR—Automatic Heating Service Inc. has been incorporated with $45,000 capital to manufacture air conditioning equipment, by L. A. Seeger, C. E. Snow and H. C. Porter, Ann Arbor.

DETROIT—Wire & Iron Products Inc. has been incorporated to manufacture steel and iron products, with $5000 capital, by R. Jackson Myers, 18481 Stoepel avenue, Detroit.

GRAND RAPIDS—Sheet Steel Development Co., H. F. Cox president, has begun production of sheet metal products. The company has just completed its organization.

Indiana

INDIANAPOLIS — American Lead Corp. has been incorporated with 10,000 shares no par value to manufacture nonferrous metals and alloys, by Burrell Wright, Edward J. Boleman and Herman L. McCray.

Illinois

JOLIET—Mattson Wire & Mfg. Co., Market and Lucas streets, has been incorporated with $100,000 preferred stock and 1000 shares no par value to manufacture raw materials, by Harry I. Mattson, box 1004, Joliet.

Southern States

NEW IBERIA, LA.—Texas Construction Co., Houston, Tex., has taken a contract to build a gas pipeline from New Iberia to Avery Island, La. George Waverly is company superintendent in charge of construction.

Missouri

ST. LOUIS—Research Electric Inc. has been formed to manufacture electrical specialties, by W. S. Cordry, 511 Wainwright building.

ST. LOUIS—City Foundry Co., 811 Park avenue, W. F. Priep president, is rebuilding a portion of its plant recently burned.

ST. LOUIS—General Sales Device Mfg. Co. has been formed to manufacture metal poultry equipment, by William Rasche, 2801 Broadway, president.

ST. LOUIS—Carwell-Colton Co., W. L. Colton, president, has been formed to manufacture hydraulic railroad jacks. Assembling and machine work will be done in a plant here, plans for which are under way.

Oklahoma

MARSHALL — Straughan Aircraft Corp. has been incorporated with $25,000 capital to manufacture airplanes, by Frank Straughan, president.

MUSKOGEE—Auto Parts & Machine Co. has been incorporated with $25,000 capital to operate an automotive machine shop, by Don Williamson, 611 West Broadway, manager.

OKLAHOMA CITY—Rotary Equipment Corp. has been incorporated with $25,000 capital to manufacture oilfield equipment, by H. B. Hopps, Equity building.

Texas

EL PASO—Reynolds Electrical & Engineering Co. has been incorporated to manufacture electrical products, by L. J. Reynolds, 3707 Hastings street.

HENDERSON—C. W. Rettig is head of a company being formed to build a garage 48 x 100 feet, including a machine shop. DeFee & White are architects.

Dominion of Canada

NIAGARA FALLS, ONT.—Canadian Carborundum Co. Ltd., has let general contract to Gardner Construction Co., 22 Cross street, Welland, Ont., for two buildings at its plant. Structural steel and iron is let to Reid & Brown Structural Steel & Iron Works, Ltd., Fleet street, Toronto.

TORONTO, ONT. — Guaranteed Parts Ltd. has been incorporated with $40,000 capital to manufacture machinery, by George H. Gilday, Toronto.

YORK TOWNSHIP, ONT.—McQuay-Norris Mfg. Co., 37 Pearl street, Toronto, manufacturer of piston rings, has awarded contracts for a plant here. Equipment, including lathes, machine and bench tools, will be bought later. Baldwin & Greene, 26 Bloor street west, Toronto, Ont., are architects.

CAP DE LA MADELEINE, QUE.—Bylaw to authorize expenditure of $75,000 for elevated steel tank and new pumps for waterworks plant will be voted on soon. A. Plamondon, 30 St. James street west, Montreal, Que., is engineer.

MONTREAL, QUE.—Electrocoin Appliances Ltd. has been incorporated with $150,000 capital and 10,000 shares no par value to manufacture automatic appliances, by Walter F. Graw, Montreal.

MONTREAL, QUE.—Lighting Appliance Co. of Canada Ltd. has been incorporated with $50,000 capital to manufacture lighting appliances, by Frederick Franke, Westmont, Que.

JUNEAU—Fire destroyed the $500,000 cannery plant at Taku Harbor, owned by Libby, McNeil & Libby, Chicago.

New Trade Publications

STEEL BUILDINGS — International Derrick & Equipment Co., Columbus, O., has issued a bulletin on its standard steel buildings. Details of construction are shown in illustrations and completed buildings as well.

PEROXYGEN COMPOUNDS — A booklet by the Roessler & Hasslacher Chemical Co., Niagara Falls, N. Y., is devoted to its peroxygen compounds for oxidation processes. It lists important uses and gives physical properties, specifications, shipping containers and other pertinent data.

OIL SEALS—Aetna Ball Bearing Mfg. Co., 4600 Schubert avenue, Chicago, describes its oil seal in a current booklet. Diagrams show application of the seal on various classes of machinery, to eliminate leakage of oil, grease or water and to keep grit, dirt and water out of bearings. A tabulation of sizes and dimensions is given.

RESISTANCE MEASUREMENTS —Leeds & Northrup Co., Philadelphia, has issued its Catalog No. 40, covering devices for electrical resistance measurements. It covers standard resistors, resistance boxes, Wheatstone bridges, Kelvin bridges and other devices of similar nature. It is illustrated to show the products and wiring diagrams also are given.